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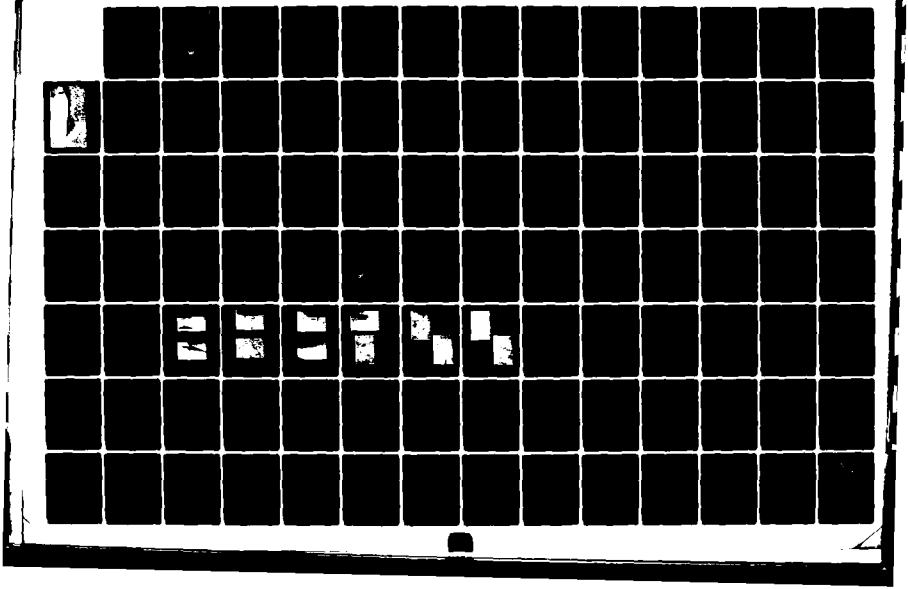

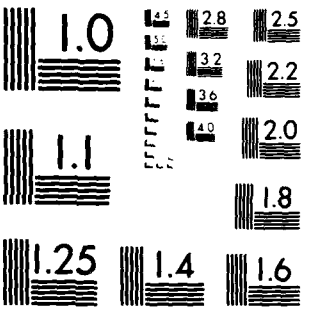

NAUGATUCK RIVER BASIN
OXFORD, CONNECTICUT

SEYMOUR RESERVOIR NO.3 DAM
CT 00323

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
WALTHAM, MASS. 02154

FEBRUARY 1980

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

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4. TITLE (and Subtitle) Seymour Reservoir No.3 Dam NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS		5. TYPE OF REPORT & PERIOD COVERED INSPECTION REPORT 6. PERFORMING ORG. REPORT NUMBER
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Cover program reads: Phase I Inspection Report, National Dam Inspection Program; however, the official title of the program is: National Program for Inspection of Non-Federal Dams; use cover date for date of report.

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

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Naugatuck River Basin
Oxford, Connecticut

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The Seymour Reservoir No.3 Dam consists of an earth embankment with a masonry core wall. The embankment has a top width of 14 feet and a maximum height of 42 feet. The overall length of the dam is 730 feet, including a 23.5 foot long concrete overflow spillway. Based on the visual inspection and a review of all available pertinent data, the dam is considered to be in fair condition. The dam is classified as "Intermediate" in size with a significant hazard potential. A test flood equal to ½ the Probable Maximum Flood was selected.

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DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02154

REPLY TO
ATTENTION OF
NEDED

APR 2 1 1980

Honorable Ella T. Grasso
Governor of the State of Connecticut
State Capitol
Hartford, Connecticut 06115

Dear Governor Grasso:

Inclosed is a copy of the Seymour Reservoir No. 3 Dam Phase I Inspection Report, which was prepared under the National Program for Inspection of Non-Federal Dams. This report is presented for your use and is based upon a visual inspection, a review of the past performance and a brief hydrological study of the dam. A brief assessment is included at the beginning of the report. I have approved the report and support the findings and recommendations described in Section 7 and ask that you keep me informed of the actions taken to implement them. This follow-up action is a vitally important part of this program.

A copy of this report has been forwarded to the Department of Environmental Protection, the cooperating agency for the State of Connecticut. In addition, a copy of the report has also been furnished the owner, The Bridgeport Hydraulic Company, 835 Main Street, Bridgeport, Connecticut 06609.

Copies of this report will be made available to the public, upon request, by this office under the Freedom of Information Act. In the case of this report the release date will be thirty days from the date of this letter.

I wish to take this opportunity to thank you and the Department of Environmental Protection for your cooperation in carrying out this program.

Sincerely,

MAX B. SCHEIDER
Colonel, Corps of Engineers
Division Engineer

Incl
As stated

SEYMOUR RESERVOIR NO. 3 DAM
CT 00323

NAUGATUCK RIVER BASIN
OXFORD, CONNECTICUT

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

NATIONAL DAM INSPECTION PROGRAM
PHASE I INSPECTION REPORT

IDENTIFICATION NO: CT 00323

NAME OF DAM: Seymour Reservoir No. 3 Dam

TOWN: Oxford

COUNTY AND STATE: New Haven County, Connecticut

STREAM: Tributary to Hemp Swamp Brook

DATE OF INSPECTION: November 28, 1979

BRIEF ASSESSMENT

The Seymour Reservoir No. 3 Dam consists of an earth embankment with a masonry core wall. The embankment has a top width of 14 feet and a maximum height of 42 feet. The overall length of the dam is 730 feet, including a 23.5 foot long concrete overflow spillway. The outlet works consist of a 12-inch cast iron low level outlet or blowoff pipe through the earth embankment and core wall.

The dam impounds the Seymour No. 3 Reservoir, a storage reservoir for public water supply for the Valley Division of the Bridgeport Hydraulic Company.

Based on the visual inspection and a review of all available pertinent data, the dam is considered to be in fair condition. Features that could affect the structural integrity of the dam are undermining and seepage associated with the left wall of the spillway discharge channel; uncontrolled seepage that bypasses the underdrain; and the absence of an upstream gate on the low level outlet or blowoff line.

Based on the Corps of Engineers' Recommended Guidelines for Safety Inspection of Dams, the dam is classified as "Intermediate" in

size, with a "Significant" hazard potential. A Test Flood equal to one-half the Probable Maximum Flood (1/2 PMF) was selected in accordance with the Corps of Engineers' Guidelines. The calculated Test Flood inflow of 190 cfs results in a routed outflow of 185 cfs.

The spillway can discharge 132 percent of the routed Test Flood outflow with flashboards and 151 percent without flashboards. The Test Flood would not overtop the dam.

It is recommended that the owner engage the services of a qualified, registered engineer to design and oversee construction of repairs to the left wall of the spillway discharge channel; investigate the significance of the uncontrolled seepage observed downstream of the dam and design control measures as required; and design provisions for the installation of an upstream gate on the low level outlet or blowoff pipe.

Technical inspections by a qualified, registered engineer should be performed every year; a formal operations and maintenance manual should be prepared; and a formal warning system should be put into effect.

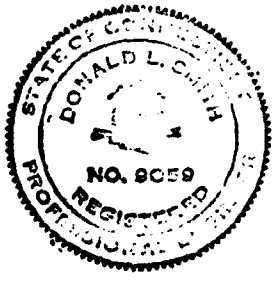
The owner should implement the recommendations as described herein and in greater detail in Section 7 of the Report within one year after receipt of this Phase I Inspection Report.

ROALD HAESTAD, INC.

Donald L. Smith

Donald L. Smith, P.E.
Project Engineer

Roald Haestad
President



This Phase I Inspection Report on Seymour Reservoir No. 3 Dam has been reviewed by the undersigned Review Board members. In our opinion, the reported findings, conclusions, and recommendations are consistent with the Recommended Guidelines for Safety Inspection of Dams, and with good engineering judgment and practice, and is hereby submitted for approval.

Carney M. Terzian

CARNEY M. TERZIAN, MEMBER
Design Branch
Engineering Division

Richard J. DiBuono

RICHARD DIBUONO, MEMBER
Water Control Branch
Engineering Division

ARAMAST MAHTESIAN, CHAIRMAN
Geotechnical Engineering Branch
Engineering Division

APPROVAL RECOMMENDED:

Joe B. Fryar

JOE B. FRYAR
Chief, Engineering Division

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I Investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the

condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Phase I Inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test Flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

The Phase I Investigation does <u>not</u> include an assessment of the need for fences, gates, no-trespassing signs, repairs to existing fences and railings and other items which may be needed to minimize trespass and provide greater security for the facility and safety of the public. An evaluation of the project for compliance with OSHA rules and regulations is also excluded.

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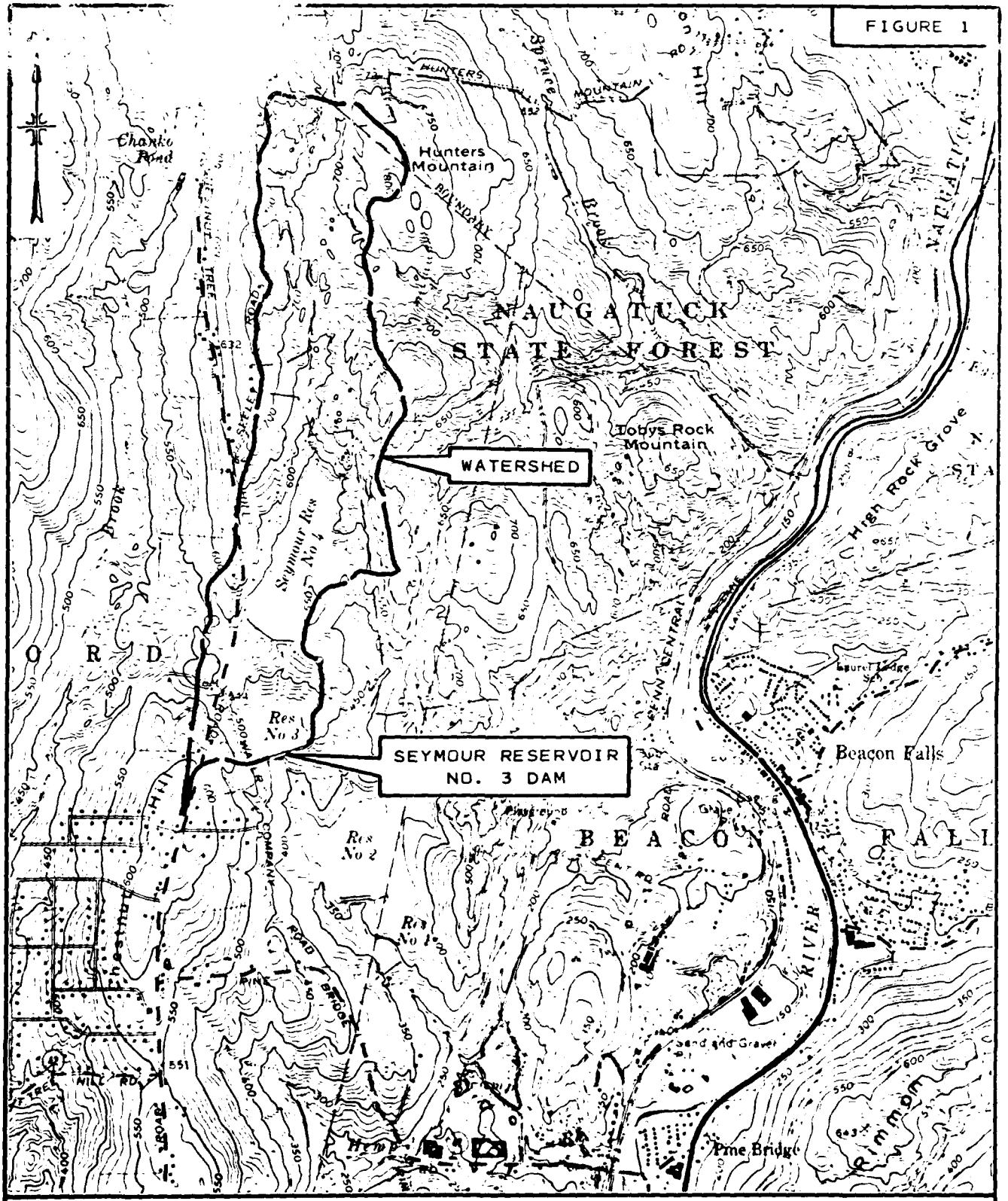
U.S.ARMY ENGINEER DIV NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASSACHUSETTS	NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS	SEYMOUR RESERVOIR NO. 3 DAM - CT 00323
ROALD HAESTAD, INC. CONSULTING ENGINEERS WATERBURY, CONNECTICUT		TRIBUTARY TO HEMP SWAMP BROOK OXFORD, CONNECTICUT DATE: 1/ /81

FIGURE 1



LOCATION PLAN

SEYMOUR RESERVOIR NO. 3 DAM
OXFORD, CONNECTICUT

SCALE: 1" = 2000'

ROALD HAESTAD, INC.

NATIONAL DAM INSPECTION PROGRAM
PHASE I INSPECTION REPORT

PROJECT INFORMATION
SECTION 1

1.1 General

a. Authority

Public Law 92-367, August 8, 1972, authorized the Secretary of the Army, through the Corps of Engineers, to initiate a National Program of Dam Inspection throughout the United States. The New England Division of the Corps of Engineers has been assigned the responsibility of supervising the inspection of dams within the New England Region. Roald Haestad, Inc., has been retained by the New England Division to inspect and report on selected dams in the State of Connecticut. Authorization and notice to proceed were issued to Roald Haestad, Inc. under a letter of November 1, 1979, from William E. Hodgson, Jr., Colonel, Corps of Engineers. Contract No. DACW33-80-C-0015 has been assigned by the Corps of Engineers for this work.

b. Purpose of Inspection

The Purposes of the program are to:

1. Perform technical inspection and evaluation of non-federal dams to indentify conditions requiring correction in a timely manner by non-federal interest.
2. Encourage and prepare the States to quickly initiate effective dam inspection programs for non-federal dams.
3. To update, verify and complete the National Inventory of Dams.

1.2 Description of Project

a. Location

The dam is located downstream of Seymour Reservoir No. 4, on an unnamed tributary to Hemp Swamp Brook in the Town of Oxford, Connecticut, between Chestnut Tree Hill Road and the Oxford-Beacon Falls Town Line. The dam is shown on the Naugatuck Quadrangle Map having coordinates of latitude N 41°26.7', and longitude W 73°05.4'.

b. Description of Dam and Appurtenant Structures

The dam consists of an earth embankment with a masonry core wall. The embankment has a top width of 14 feet, a maximum height of 42 feet, an upstream slope of 2 horizontal to 1 vertical, and a downstream slope of approximately 2.5 horizontal to 1 vertical. The upstream slope is protected with riprap and the downstream slope is grass covered. Drawings indicate that the core wall extends approximately 4 feet below the original ground surface to within 3 feet of the top of the dam. The core wall has a top width of 2 feet and increases 1 foot in width for every 10 feet of depth. The overall length of the dam is 730 feet, including a 23.5 foot long concrete overflow spillway located near the right end of the dam. A steel beam bridge with a wood deck spans the spillway. The outlet works located approximately 210 feet from the right abutment consists of a 12-inch cast iron low level outlet or blowoff pipe through the dam and core wall controlled by a manually operated downstream gate. Drawings indicate that the pipe is supported by a masonry core wall and that an upstream intake structure with screens is located at the toe of the upstream slope. Drawings also indicate that an underdrain was installed at the downstream toe of the dam.

c. Size Classification - "Intermediate"

According to the Corps of Engineers' Recommended Guidelines for Safety Inspection of Dams, a dam is classified as "Intermediate" in size if the height is between 40 feet and 100 feet, or the dam impounds between 1,000 Acre-Feet and 50,000 Acre-Feet. The dam has a maximum height of 42 feet and a maximum storage capacity of 245 Acre-Feet. Therefore, the dam is classified as "Intermediate" in size based on height.

d. Hazard Classification - "Significant"

Based on the Corps of Engineers' Recommended Guidelines for Safety Inspection of Dams, the Hazard Classification for the dam is "Significant". A dam failure analysis indicated that a breach of Seymour Reservoir No. 3 Dam would cause Seymour Reservoir No. 2 Dam to be overtopped by approximately 4 feet and Seymour Reservoir No. 1 Dam to be overtopped by approximately 7-1/2 feet. For computational purposes the downstream dams were assumed not to fail. The depth of flow in the stream in the area of four downstream houses prior to dam breach is 2 feet, based on the maximum spillway capacity of 280 cfs. The peak flow in this area due to the dam breach is 13,000 cfs, equivalent to a depth of flow of 9.8 feet or approximately 2.5 feet above the sill elevation of the four houses. The dam failure could result in the loss of a few lives and an economic loss associated with the failure of the downstream dams.

e. Ownership

Former Owner: The Seymour Water Company

Present Owner: The Bridgeport Hydraulic Company
835 Main Street
Bridgeport, Connecticut 06609
(203) 367-6621

f. Operator: George Smith, Manager, Valley Division
The Bridgeport Hydraulic Company
70 New Haven Road
Seymour, Connecticut 06483
(203) 888-4511

g. Purpose of Dam

The dam impounds Seymour Reservoir No. 3, a storage reservoir for public water supply for the Valley Division of the Bridgeport Hydraulic Company.

h. Design and Construction History

The dam was designed in 1915 and construction was assumed to have taken place in 1915 also. No records of the original construction are known to exist, but it is believed that the dam was constructed by C.W. Blakeslee and Sons. In 1960 the dam was raised approximately 2 feet, a downstream drain and embankment constructed, and modifications made to the spillway discharge channel. The construction was done by C.W. Blakeslee and Sons, as designed by Clarence Blair Associates, Inc. In 1968, portions of the spillway weir and portions of the training walls were rebuilt by Park City Builders. No plans for the work are known to exist, but it is reported that 3/4-inch reinforcing rods were grouted approximately 3 feet into ledge prior to constructing the new concrete weir and constructing the new concrete walls against the existing stone masonry walls.

i. Normal Operational Procedures

Seymour Reservoir No. 3 is a storage reservoir for public water supply. During the summer months the low level outlet or blowoff is left open to allow water to flow to two downstream reservoirs (Reservoir Nos. 1 and 2) prior to treatment and distribution. The low level outlet or blowoff at an upstream reservoir (Reservoir No. 4) is also left open during the summer months to supplement the flow to the downstream reservoirs.

1.3 Pertinent Data

a. Drainage Area

The drainage area consists of 0.68 square miles of rolling, wooded terrain, the majority of which is either State Forest or is owned by the Bridgeport Hydraulic Company.

b. Discharge at Damsite

The discharge at the damsite is over a 23.5-foot long concrete overflow spillway. Outlet works consist of a 12-inch long cast iron low level outlet or blowoff through the dam controlled by a downstream gate.

1.	Outlet Works (conduit) Size:	12-inch
	Invert Elevation:	413.3 at Outlet
	Discharge Capacity:	13 cfs
2.	Maximum Known Flood at Damsite:	Unknown
3.	Ungated Spillway Capacity at Top of Dam:	280 cfs
	Elevation:	455.4*
4.	Ungated Spillway Capacity at Test Flood Elevation:	185 cfs
	Elevation:	455.0
5.	Gated Spillway Capacity at Normal Pool Elevation:	N/A
	Elevation:	N/A
6.	Gated Spillway Capacity at Test Flood Elevation:	N/A
	Elevation:	N/A
7.	Total Spillway Capacity at Test Flood Elevation:	185 cfs
	Elevation:	455.0
8.	Total Project Discharge at Top of Dam:	280 cfs
	Elevation:	455.4*
9.	Total Project Discharge at Test Flood Elevation:	185 cfs
	Elevation:	455.0

*Low Point of Dam Crest

c. Elevation - Feet Above NGVD (formerly MSL Datum of 1929)

1. Streambed at Toe of Dam:	413
2. Bottom of Cutoff:	412
3. Maximum Tailwater:	N/A
4. Recreation Pool:	N/A
5. Full Flood Control Pool:	N/A
6. Spillway Crest:	453
7. Design Surcharge - Original Design:	Unknown
8. Top of Dam:	456± Average 455.4 Low Point
9. Test Flood Surcharge:	455.0

d. Reservoir - Length in Feet

1. Normal Pool:	900
2. Flood Control Pool:	N/A
3. Spillway Crest Pool:	900
4. Top of Dam:	900
5. Test Flood Pool:	900

e. Storage - Acre-feet

1. Normal Pool:	206 Ac.-Ft.
2. Flood Control Pool:	N/A
3. Spillway Crest Pool:	206 Ac.-Ft.
4. Top of Dam:	245 Ac.-Ft.
5. Test Flood Pool:	232 Ac.-Ft.

f. Reservoir Surface - Acres

1. Normal Pool:	13 Acres
2. Flood-Control Pool:	N/A
3. Spillway Crest:	13 Acres
4. Test Flood Pool:	14 Acres
5. Top of Dam:	14 Acres

g. Dam

1. Type:	Earth embankment with masonry core wall
2. Length:	730 feet
3. Height:	42 feet
4. Top Width:	14 feet
5. Side Slopes:	2 Horizontal to 1 Vertical Upstream 2.5 Horizontal to 1 Vertical Downstream
6. Zoning:	Unknown
7. Impervious Core:	Masonry core wall 2 feet wide at top, increases in width 1 foot for each 10 feet of depth
8. Cutoff:	Core wall extends 4 feet below original ground
9. Grout Curtain:	N/A
10. Other:	Underdrain at downstream toe

h. Diversion and Regulating Tunnel

1. Type:	N/A
2. Length:	N/A
3. Closure:	N/A
4. Access:	N/A
5. Regulating Facilities:	N/A

i. Spillway

1. Type:	Concrete Overflow
2. Length of Weir:	23.5
3. Crest Elevation with Flashboards: without Flashboards:	 453 451.2 (2.9-foot long slot only)
4. Gates:	N/A
5. Upstream Channel:	None
6. Downstream Channel:	Discharge channel paved with stones and mortar
7. General:	Concrete training wall and bridge abutments poured over existing stone masonry. Bridge over spillway.

j. Regulating Outlets

1. Invert:	413.3 at outlet
2. Size:	12-inch
3. Description:	Cast iron pipe through dam and core wall; supported on masonry wall; controlled by downstream gate.
4. Control Mechanism:	Manually operated gate valve.
5. Other:	Capacity - 13 cfs

ENGINEERING DATA
SECTION 2

2.1 Design Data

Design data consisted of the original plans for the dam, dated January, 1915, and plans for the raising of the dam and installation of a downstream underdrain, dated October, 1960, by Clarence Blair Associates, Inc. No plans are known to exist for the reconstruction of the spillway and construction of the bridge.

2.2 Construction Data

No construction data was available for review. It is reported that the dam was originally constructed by C.W. Blakeslee and Sons about 1915. The raising of the dam and construction of the downstream underdrain were performed by C.W. Blakeslee and Sons about 1960. The spillway weir and portions of the training walls were reconstructed in 1968 by Park City Builders. No plans for this work are known to exist, but Water Company personnel indicate that 3/4-inch diameter reinforcing rods were grouted approximately 3 feet into ledge to anchor the new concrete weir. The new concrete walls were constructed over and around the existing stone masonry walls.

2.3 Operational Data

Daily records of the reservoir level are maintained. The reservoir is normally below spillway level between late summer and early spring.

2.4 Evaluation of Data

a. Availability

Existing data was provided by the Bridgeport Hydraulic Company. A list of available reference material is given in Appendix B.

b. Adequacy

The information that was available, along with the visual inspection, past performance history, and hydraulic and hydrologic calculations, were adequate to assess the condition of the facility.

c. Validity

Field inspections and surveys indicate that the dam was constructed substantially as shown on the plans and as indicated by the owner.

VISUAL INSPECTION

SECTION 3

3.1 Findings

a. General

The visual inspection of the dam was conducted on November 28, 1979. At the time of inspection, the water level was approximately 6.5 feet below spillway level. The general condition of the dam at the time of the inspection was fair.

The dam is an earth embankment with a concrete overflow spillway located near the right end of the dam. The outlet works consist of a 12-inch cast iron pipe through the dam controlled by a downstream valve.

b. Dam

The upstream slope of the dam is covered with riprap except for the upper 1 to 2 feet of the slope. There is some downward movement of the riprap and some erosion near the crest, Photo 1.

The crest is used as a service road and it is in good condition with no significant erosion. The elevation of the crest varies.

The downstream slope is grass covered with no evidence of seepage, Photo 2. The difference in the color of the grass on the downstream slope as shown in Photo 2 did not appear to be associated with seepage. Some soft and depressed areas were observed against the left wall of the spillway discharge channel.

Downstream of the dam three major wet areas were observed. An 8-inch pipe is apparently a discharge for an underdrain, shown in the October 1960 drawings. The pipe is discharging near the

12-inch blowoff pipe, Photo 3. The discharge was estimated at approximately 60 gals/min. A second wet area exists approximately 50 feet to the left of the blowoff pipe (see Figure 2, Appendix B). No pipe was observed in this area, the ground was soft and spongy, and there was standing water with rust-colored floccules. A third wet area exists at the toe near the left abutment where a corrugated metal pipe was discharging rust-colored water, Photo 4. Immediately upstream of the end of the corrugated metal pipe there is what appears to be a toe berm, which is not shown in the October 1960 drawings.

c. Appurtenant Structures

The spillway has a concrete weir and concrete training walls which are in good condition, Photos 5 and 6. The spillway discharge channel has stone masonry walls on each side, except for a concrete left wall added at the downstream end of the stone masonry wall when the downstream slopes were flattened, as shown on the October 1960 drawings, Photo 7. There is seepage into the channel from the right in an area where the stone masonry wall is missing and bedrock is exposed. In one location, a crack has developed in the right wall, Photo 8. Adjacent to the top of the left wall there are indications of ground settlement, Photo 9. In the concrete section of the left wall, there is a seep near the top of the wall, Photo 10, and a void under the foundation of the wall extending about 2 feet horizontally under the foundation. The floor of the channel is paved with stones and mortar. There are some voids in the paved floor, Photo 11, as a result of the missing mortar. Farther downstream the floor is bouldery and water could be observed

flowing under the boulders. The flow of water at the end of the channel, Photo 12, exceeds the observed seepage out of the right abutment. Thus, there is considerable additional seepage entering the spillway channel, possibly under the left wall and from the dam and its foundation. The seep in the left concrete wall, Photo 10, is indicative of a water level in the dam next to the spillway that is close to the surface of the slope.

A 12-inch low level outlet pipe is controlled by a downstream valve. The valve and downstream end of the pipe can be observed in Photo 3 (pipe left of photo).

A steel beam bridge with a wooden deck spans the spillway, Photos 5 and 6. One of the beams is slightly bent, but there are no indications that the bending took place after construction of the bridge. The concrete abutments which form the spillway training walls are in good condition, as is the wooden deck.

d. Reservoir Area

The shore of the reservoir is thickly wooded. No indications of slope instability were observed in the vicinity of the dam.

e. Downstream Channel

The downstream channel is a natural streambed leading into Seymour Reservoir No. 2.

3.2 Evaluation

On the basis of the visual inspection, the dam is judged to be in fair condition. The future integrity of the dam can be affected by the following:

a) Undermining of the left wall of the spillway channel

and apparent seepage under the wall can eventually lead to collapse of the wall.

b) Uncontrolled seepage downstream of the dam that is by-passing the underdrain system can lead to erosion and piping.

c) The inability to shut off the low level outlet or blow-off at the upstream end should a leak occur.

d) The erosion and movement of riprap at the left side of the spillway.

OPERATIONAL AND MAINTENANCE PROCEDURES

SECTION 4

4.1 Operational Procedures

a. General

The low level outlet or blowoff is normally opened during the summer months to allow water to flow from the impoundment to downstream reservoirs (Seymour Reservoir Nos. 1 and 2). An inspection of the dam was made by Philip W. Genovese and Associates, Inc. in January 1979. A copy of the inspection report is included in Appendix B.

b. Description of Any Warning System in Effect

The dam is monitored during periods of heavy rainfall and if an emergency arose, steps would be taken to notify the downstream residents.

4.2 Maintenance Procedures

a. General

Normal maintenance procedures consist of mowing the grass on the downstream slopes and regrading the roadway at the top of the dam as required. Necessary repairs are also made as required.

b. Operating Facilities

No formal maintenance procedures exist for the operating facilities.

4.3 Evaluation

Present operations and maintenance procedures are satisfactory and should remain in effect. The current practice of having the dam inspected by a qualified, registered engineer should continue, with the inspections being made annually. An operations and maintenance manual should be prepared for the dam and operating facilities.

The warning system which is currently in effect should be formalized and should include monitoring of the dam during extremely heavy rains, and procedures for notifying downstream authorities in the event of an emergency.

EVALUATION OF HYDRAULIC/HYDROLOGIC FEATURES

SECTION 5

5.1 General

Seymour Reservoir No. 3 Dam is the second reservoir in a series of four, and is located upstream of Reservoir Nos. 1 and 2. The dam has a tributary watershed of 0.68 square miles, 0.54 square miles of which are tributary to Reservoir No. 4 upstream. The terrain is "rolling", wooded hills essentially undeveloped, with most of the watershed owned by the Bridgeport Hydraulic Company or designated as State Forest. The spillway is concrete, 23.5 feet wide, with a slot in the center for flashboards 2.9 feet wide and 1.8 feet deep. Flashboards were in place at the time of inspection.

The dam crest is uneven with a low point 2.4 feet above spillway level.* The average crest height of the dam is 3 feet above spillway. The spillway has a capacity of 245 cfs with the flashboards and 280 cfs without the flashboards before overtopping the low point of the dam crest.

5.2 Design Data

No computations were found for the design of the dam or the spillway. An engineering report dated January 2, 1979 gives the spillway capacity as 249 cfs with the flashboards.

5.3 Experience Data

There is no known record of the dam ever overtopping.

5.4 Test Flood Analysis

Based on the dam failure analysis the dam is classified as "Significant" hazard potential. The size of the dam is "Intermediate"

*Spillway level = top of flashboards

because of height although it has only 245 Acre-Feet of storage.

Based on the Corps of Engineers' Recommended Guidelines for Safety Inspection of Dams, the Test Flood should be in the range of 1/2 PMF to PMF, depending on the involved risk. A Test Flood equal to 1/2 PMF was selected. Flood routing was started at Seymour Reservoir No. 4 Dam, the upper reservoir in the series. An inflow flood peak of 575 cfs was calculated for the 0.54 square mile watershed of Reservoir No. 4 Dam using the peak runoff of 1,060 cubic feet per second per square mile (csm) from the guide curve for "rolling" terrain supplied by the Corps of Engineers. A triangular hydrograph was calculated using the methodology given in Design of Small Dams by the Bureau of Reclamation. The peak inflow rate of 575 cfs and a total runoff of 9.5 inches for the 1/2 PMF were used to calculate the inflow hydrograph. The flood was routed through Reservoir No. 4. Only about one-third of the outflow from Reservoir No. 4 goes to Reservoir No. 3, the remainder flows into Reservoir No.2. The outflow from Reservoir No. 4 was added to the inflow for the 0.14 square mile watershed of Reservoir No. 3 to obtain the total inflow hydrograph for Reservoir No. 3. Peak inflow to Reservoir No. 3 is 190 cfs. The arithmetical trial-and-error tabular method was used for the routings. Both reservoirs were assumed to be initially at spillway level.

The Test Flood was routed through Reservoir No. 3 and produced a maximum discharge of 185 cfs which would come within 0.4 feet of overtopping the low point in the dam crest. The spillway capacity of 245

cfs with flashboards is equal to 132 percent of the Test Flood. The spillway capacity of 280 cfs without flashboards is equal to 151 percent of the Test Flood. The spillway capacity is judged to be adequate.

5.5 Dam Failure Analysis

A dam failure analysis was made using the "Rule of Thumb" guidance provided by the Corps of Engineers. Failure was assumed with water level at the top of the dam. The dam breach calculations show a peak release of 91,500 cfs into the valley below the dam. This would empty the reservoir in less than 2 minutes. The flood wave was routed through Seymour Reservoir Nos. 2 and 1 and downstream to the confluence with the Naugatuck River.

Seymour Reservoir No. 2 has a large surface area relative to No. 3 and substantially reduces the flood wave. The flood wave would overtop Reservoir No. 2 Dam by about 4 feet and Reservoir No. 1 Dam by about 7-1/2 feet. For computation purposes the dams were assumed not to fail.

The depth of flow in the stream in the area of four downstream houses prior to dam breach is 2 feet, based on the maximum spillway capacity of 280 cfs. The peak flow in this area due to the dam breach is 13,000 cfs, equivalent to a depth of flow in the river of 9.8 feet or approximately 2.5 feet above sill elevation of the four houses. The dam is classified as "Significant" hazard potential A dam failure could result in the loss of a few lives and an economic loss associated with the failure of the downstream dams.

The dam breach calculations and the areas of potential flooding are shown in Appendix D.

EVALUATION OF STRUCTURAL STABILITY
SECTION 6

6.1 Visual Observations

The visual inspection did not disclose any indications of structural instability.

6.2 Design and Construction Data

The design and construction data consist of a plan dated January 1915 showing cross sections, and a plan of the dam; and drawings dated October 1960, which show the flattening of the downstream slope, installation of an underdrain and raising of the dam. A core wall is shown on the original plan, but no information is presented on the type of soil in the earth embankment. Thus a stability analysis cannot be performed and the evaluation of structural stability is based solely on the visual inspection.

6.3 Post-Construction Changes

Seymour Reservoir No. 4 Dam was constructed in 1951, approximately 1,000 feet upstream from Reservoir No. 3. The bridge over the spillway was constructed at an unknown date and the original spillway was rebuilt in 1968.

6.4 Seismic Stability

The dam is located in Seismic Zone I and in accordance with the recommended Phase I inspection guidelines does not warrant seismic stability analysis.

ASSESSMENT, RECOMMENDATIONS, & REMEDIAL MEASURES
SECTION 7

7.1 Dam Assessment

a. Condition

On the basis of the visual inspection, the dam is judged to be in fair condition. The following features can affect the future integrity of the dam:

1. Undermining of the left wall of the spillway discharge channel and seepage apparently occurring under the wall.
2. Uncontrolled seepage downstream of the dam that is bypassing the underdrain.
3. The 12-inch cast iron pipe through the dam is controlled by a downstream gate. Therefore, the line is under pressure at all times, and can not be shut off on the upstream side should a leak develop.

b. Adequacy of Information

The information available was sufficient for performing a Phase I Inspection.

c. Urgency

The recommendations presented in Sections 7.2 and 7.3 should be carried out within one year of receipt of this Report by the owner.

7.2 Recommendations

The following recommendations should be carried out under the direction of a qualified, registered engineer.

1. Design and construct repairs to the foundation for

the left wall of the spillway discharge channel. The design should consider the need for seepage control measures behind the wall.

2. Investigate the significance of the uncontrolled seepage observed downstream of the dam that was by-passing the underdrain pipes. Design and construct any required seepage control measures.

3. Provide an upstream gate on the blowoff line so that the pipe through the dam is not under pressure continuously.

7.3 Remedial Measures

a. Operation and Maintenance Procedures

1. Technical inspections by qualified, registered engineers should be made annually.

2. A formal operations and maintenance manual for the dam and operating facilities should be prepared.

3. A formal warning system should be put into effect and should include monitoring of the dam during extremely heavy rains (presently in effect) and procedures for notifying downstream authorities in the event of an emergency.

4. The riprap slope protection to the left of the spillway should be repaired.

7.4 Alternatives

There are no practical alternatives to the above recommendations.

APPENDIX A

VISUAL CHECK LIST WITH COMMENTS

VISUAL INSPECTION CHECK LIST
PARTY ORGANIZATION

PROJECT: Seymour Reservoir No. 3 Dam

DATE: 11/28/79 TIME: 1:30 p.m. WEATHER: Sunny - Approximately 40°

W.S. ELEVATION: 446.5 U.S. N/A DN.S
(6.5' below spillway)

	PARTY	DISCIPLINE
1.	Donald L. Smith, P.E. - Roald Haestad, Inc.	Civil/Hydrologist
2.	Ronald G. Litke, P.E. - Roald Haestad, Inc.	Civil Engineer
3.	Gonzalo Castro, Ph.D., P.E. - Geotechnical Engineers, Inc.	Geotechnical Engineer
4.		
5.		
6.		

	PROJECT FEATURE	INSPECTED BY	REMARKS
1.	Dam Embankment	GC	Good - Extensive down-stream seepage
2.	Intake Channel Outlet Works-and Structure	RGL,DLS,GC	No intake channel or structure observed.
3.	Outlet Channel Outlet Works-and Structure	RGL,DLS,GC	No outlet structure. Channel is natural streambed.
4.	Spillway Weir, Outlet Works-Appr. & Disch.	RGL,DLS,GC	No appr. channel. Weir and walls good. Dis. chan. fair.
5.	Outlet Works-Service Bridge	RGL,DLS	Good
6.			
7.			
8.			
9.			
10.			
11.			
12.			

PERIODIC INSPECTION CHECK LIST

PROJECT: Seymour Reservoir No. 3 Dam DATE: 11/28/79

PROJECT FEATURE: Dam Embankment NAME: GC

DISCIPLINE: Geotechnical Engineer NAME:

AREA ELEVATION	CONDITIONS
DAM EMBANKMENT	
CREST ELEVATION	456 Average
CURRENT POOL ELEVATION	446.5
MAXIMUM IMPOUNDMENT TO DATE	Unknown
SURFACE CRACKS	None observed
PAVEMENT CONDITION	N/A
MOVEMENT OR SETTLEMENT OF CREST	None observed
LATERAL MOVEMENT	None observed
VERTICAL ALIGNMENT	Appears good
HORIZONTAL ALIGNMENT	Too irregular to judge
CONDITION AT ABUTMENT AND AT CONCRETE STRUCTURES	Depressions on downstream slope against spillway channel wall
INDICATIONS OF MOVEMENT OF STRUCTURAL ITEMS ON SLOPES	N/A
TRESPASSING ON SLOPES	None of significance
VEGETATION ON SLOPES	Downstream slope grass covered
SLOUGHING OR EROSION OF SLOPES OR ABUTMENTS	None observed
ROCK SLOPE PROTECTION - RIPRAP FAILURES	Some downslope displacements of riprap
UNUSUAL MOVEMENT OR CRACKING AT OR NEAR TOES	None observed
EMBANKMENT OR DOWNSTREAM SEEPAGE	Extensive seepage area downstream of toe
PIPING OR BOILS	None observed
FOUNDATION DRAINAGE FEATURES	None known
TOE DRAINS	Two apparent discharge pipes. Approx. 60 gpm from drain near blowoff outlet
INSTRUMENTATION SYSTEM	None known

PERIODIC INSPECTION CHECK LIST

PROJECT: Seymour Reservoir No. 3 Dam DATE: 11/28/79

PROJECT FEATURE: Outlet Works - Intake Structure and Channel NAME: DLS

DISCIPLINE: Civil Engineer NAME: RGL

AREA EVALUATED	CONDITIONS
OUTLET WORKS - INTAKE CHANNEL AND INTAKE STRUCTURE	
A. APPROACH CHANNEL:	None observable
SLOPE CONDITIONS	
BOTTOM CONDITIONS	
ROCK SLIDES OR FALLS	
LOG BOOM	
DEBRIS	
CONDITION OF CONCRETE LINING	
DRAINS OR WEEP HOLES	
B. INTAKE STRUCTURE:	
CONDITION OF CONCRETE	N/A
STOP LOGS AND SLOTS	N/A

COMMENTS:

Plans indicate a structure at the intake to the blowoff which is normally submerged.

PERIODIC INSPECTION CHECK LIST

PROJECT: Seymour Reservoir No. 3 Dam DATE: 11/28/79

PROJECT FEATURE: Outlet Works - Outlet Structure and Channel NAME: GC

DISCIPLINE: Geotechnical, Civil Engineers NAME: RGL,DLS

AREA EVALUATED	CONDITIONS
OUTLET WORKS - OUTLET STRUCTURE AND OUTLET CHANNEL	No outlet structure observed
GENERAL CONDITION OF CONCRETE	N/A
RUST OR STAINING	N/A
SPALLING	N/A
EROSION OR CAVITATION	N/A
VISIBLE REINFORCING	N/A
ANY SEEPAGE OR EFFLORESCENCE	N/A
CONDITION AT JOINTS	N/A
DRAIN HOLES	N/A
CHANNEL	Natural streambed
LOOSE ROCK OR TREES OVERHANGING CHANNEL	None of significance
CONDITION OF DISCHARGE CHANNEL	Good

PERIODIC INSPECTION CHECK LIST

PROJECT: Seymour Reservoir No. 3 Dam DATE: 11/28/79

PROJECT FEATURE: Outlet Works - Spillway Weir, Appr. & Disch. Channel NAME: GC

DISCIPLINE: Geotechnical, Civil Engineers NAME: RGL,DLS

AREA EVALUATED	CONDITIONS
OUTLET WORKS - SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS	
A. APPROACH CHANNEL:	No approach channel
GENERAL CONDITION	
LOOSE ROCK OVERHANGING CHANNEL	
TREES OVERHANGING CHANNEL	
FLOOR OF APPROACH CHANNEL	
B. WEIR AND TRAINING WALLS:	
GENERAL CONDITION OF CONCRETE	Good
RUST OR STAINING	None observed
SPALLING	None observed
ANY VISIBLE REINFORCING	No
ANY SEEPAGE OR EFFLORESCENCE	Minor efflorescence on right training wall (Bridge Abutment)
DRAIN HOLES	None observed
C. DISCHARGE CHANNEL:	
GENERAL CONDITION	Fair
LOOSE ROCK OVERHANGING CHANNEL	None observed
TREES OVERHANGING CHANNEL	None of significance
FLOOR OF CHANNEL	Paved with stone and mortar. Some holes.
OTHER OBSTRUCTIONS	None observed

COMMENTS:

Left concrete wall of discharge channel undermined approximately 2 feet. Efflorescence present approximately 1 foot below top of wall.

PERIODIC INSPECTION CHECK LIST

PROJECT: Seymour Reservoir No. 3 Dam DATE: 11/28/79

PROJECT FEATURE: Service Bridge NAME: RGL

DISCIPLINE: Civil Engineers NAME: DLS

AREA EVALUATED	CONDITIONS
OUTLET WORKS - SERVICE BRIDGE	
A. SUPER STRUCTURE:	
BEARINGS	Bears on concrete
ANCHOR BOLTS	N/A - Beams cast against, or into back wall
BRIDGE SEAT	Good
LONGITUDINAL MEMBERS	Downstream beam bent, appears to have been bent prior to bridge construction
UNDER SIDE OF DECK	Good
SECONDARY BRACING	N/A
DECK	Wood in good condition
DRAINAGE SYSTEM	N/A
RAILINGS	None
EXPANSION JOINTS	N/A
PAINT	Good
B. ABUTMENT AND PIERS:	
GENERAL CONDITION OF CONCRETE	Good
ALIGNMENT OF ABUTMENT	Good
APPROACH TO BRIDGE	Normal
CONDITION OF SEAT AND BACKWALL	Good

APPENDIX B

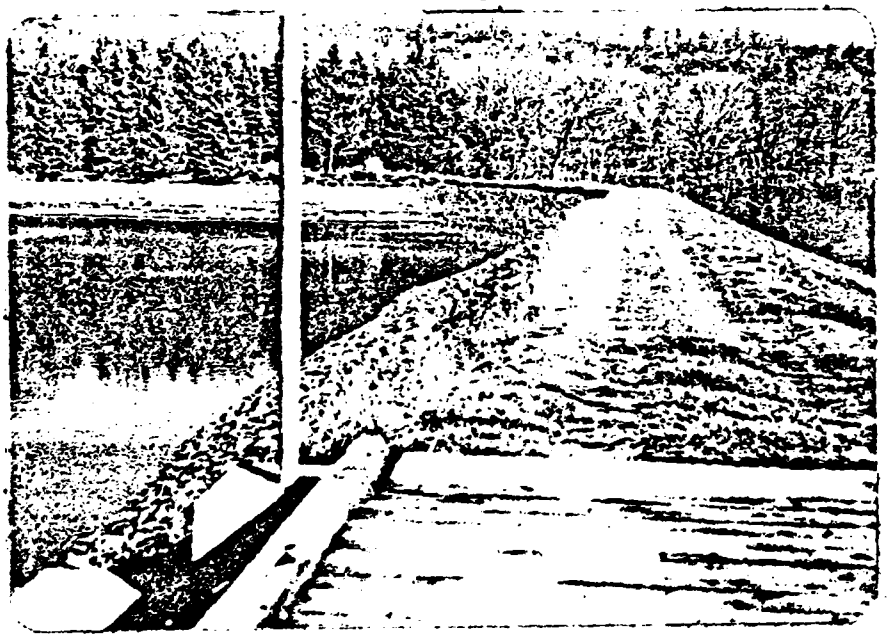
ENGINEERING DATA

LIST OF REFERENCES

The following references are all located at the Bridgeport Hydraulic Company, 835 Main Street, Bridgeport, Connecticut.

1. Plan, Profile and Sections "Seymour Water Company, Proposed Dam and Reservoir", January 30, 1915.
2. Profile and Sections, "Seymour Water Company, Reservoir No. 3", Clarence Blair and Associates, Inc., October 1960.
3. Contour Map of Reservoir Below Spillway Level, "Seymour Reservoir No. 3, 67,000,000 Gallons", August 1963.
4. Inspection Report, "Seymour Reservoir No. 3", by Philip W. Genovese & Associates, Inc., January 1979.

SEYMOUR RESERVOIR #3



DAM INSPECTION — Bridgeport Hydraulic Company Dams

Name of Dam: Seymour Reservoir #3

I. PROJECT INFORMATION:

A. AUTHORITY:

This inspection was authorized by a letter from Bridgeport Hydraulic Company dated October, 13, 1978 to Philip W. Genovese & Associates, Inc. Said letter was signed by Edward Stangl, whose title is Manager - Project Engineering. The letter was also signed by Robert Reinert, Vice President of Engineering and Planning.

B. PURPOSE:

The purpose of the study is to perform inspection and evaluation of various Bridgeport Hydraulic Dams in terms of their safety.

C. DESCRIPTION:

Seymour Reservoir #3 and the reservoir dam are located in the Town of Oxford, Connecticut. The reservoir impounds an unnamed tributary which flows several thousand feet from the dam to its confluence with the Naugatuck River. The Seymour Reservoir Dam #3 is an earthen dam with concrete spillway.

Dam: Seymour Reservoir #3

D. PERTINENT DATA:

1.	Drainage Area:	0.66 square miles	422 acres
2.	Discharge at Dam:	Does not apply.	
3.	Elevation:	Drawn down at time of inspection.	
4.	Reservoir:	Maximum pool length = 800 ft ±	
5.	Storage:	Does not apply.	
6.	Reservoir Surface:	Does not apply.	
7.	Dam:		
	Type:	Earthen	
	Length:	750 ft ±	
	Height:	35 ft	
	Top Width:	15 ft ±	
	Side Slopes: Up Stream		approx. 2 to 1
	Down Stream		approx. 3.2 to 1
8.	Diversion and Regulating Controls:	Does not apply.	
9.	Spillway:	See Attached Sketch	
	Type:	Concrete and cement rubble masonry	
	Length of Weir:	See Attached Sketch	
	Gates:	None	
	Up Stream Channel:	See Attached Sketch	
	Down Stream Channel:	See Attached Sketch	

Dam: Seymour Reservoir #3

II. ENGINEERING DATA (Existing):

Cross Sections (Bridgeport Hydraulics) September, 1960; Profiles and Typical Cross Section (Blair Associates) October, 1960; Contours (B.H.) August, 1963.

III. VISUAL INSPECTION:

A. FINDINGS:

The earthen embankment appears to have adequate slope stability with some minor settlement up stream. There is some seepage down stream beyond the toe at approximately the same distance as the pipe outlet toward the easterly end of the dam. Slope protection is in the form of stone rip-rap and armour stone up stream and grass down stream.

Blair Associates, New Haven, Connecticut drawings of 10/1960 indicate toe and foundation drains.

B. EVALUATION:

The dam appears to be in good condition with the exception of the deficiencies noted under "FINDINGS".

IV. OPERATIONAL PROCEDURES:

Does not apply

V. HYDROLOGY AND HYDRAULIC ANALYSES:

The results of the analysis of the hydrology and hydraulics of the dam indicate that with flashboards, in place, the dam would be overtopped at a flow of 249 cfs, which compares to a frequency of approximately 110 years. The hydraulic controls for this structure are:

Control	Flow (cfs)	Frequency (years)
Top of Dam, w/flbds. *	249	110
Bottom of Bridge	327	200+

*flashboards

VI. STRUCTURAL STABILITY:

A. VISUAL OBSERVATION:

1. **Embankment:** Visual examination of the embankment indicates no structural problems.

2. **Appurtenant Structures:** Visual inspection of the spillway and retaining walls reveals no evidence of instability.

Dam: Seymour Reservoir #3

B. DESIGN AND CONSTRUCTION DATA:

Does not apply

C. OPERATING RECORDS:

Does not apply

D. POST CONSTRUCTION CHANGES:

Does not apply

E. SEISMIC STABILITY:

The dam is located in seismic zone #1.

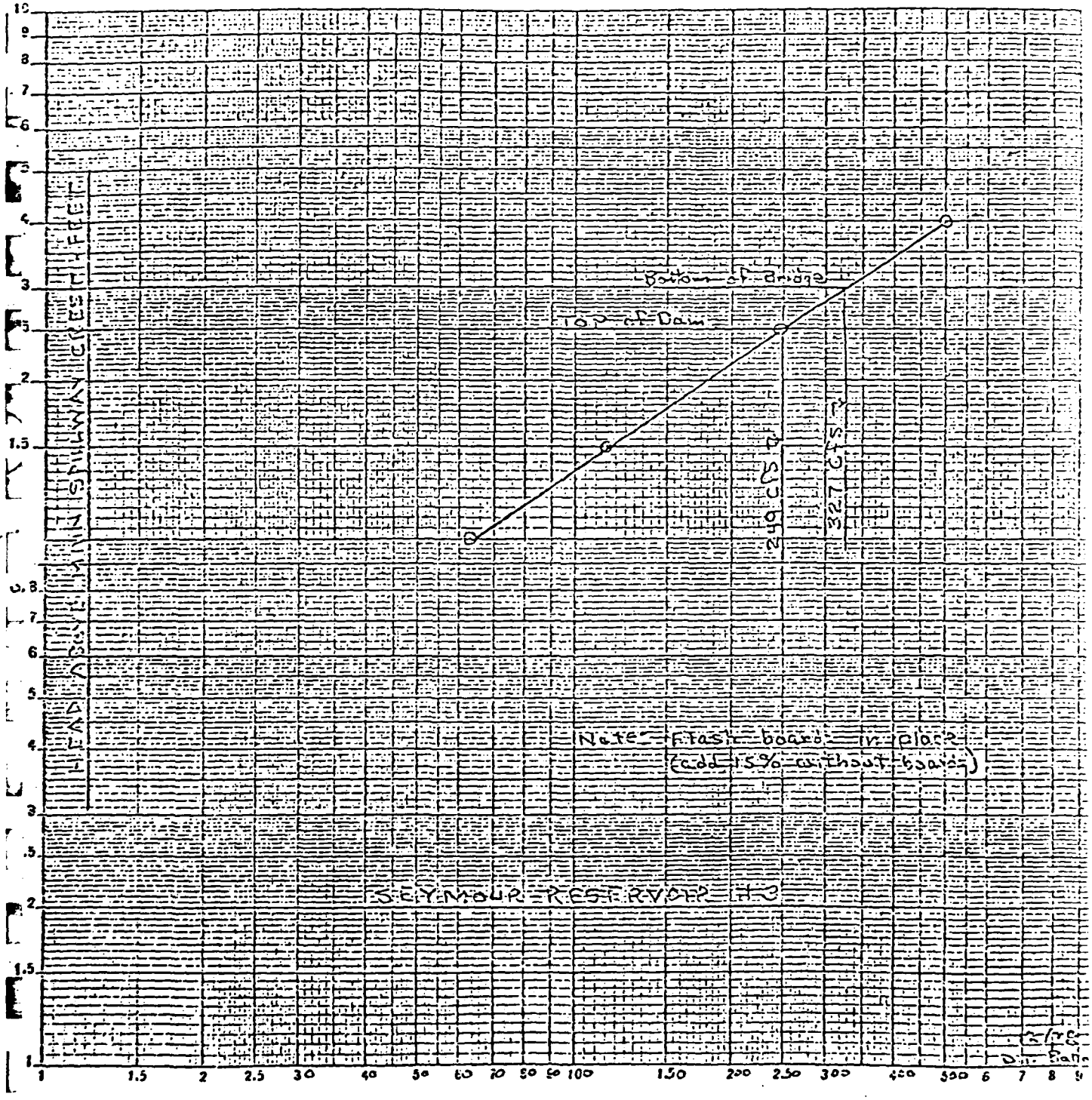
VII. DAM ASSESSMENT:

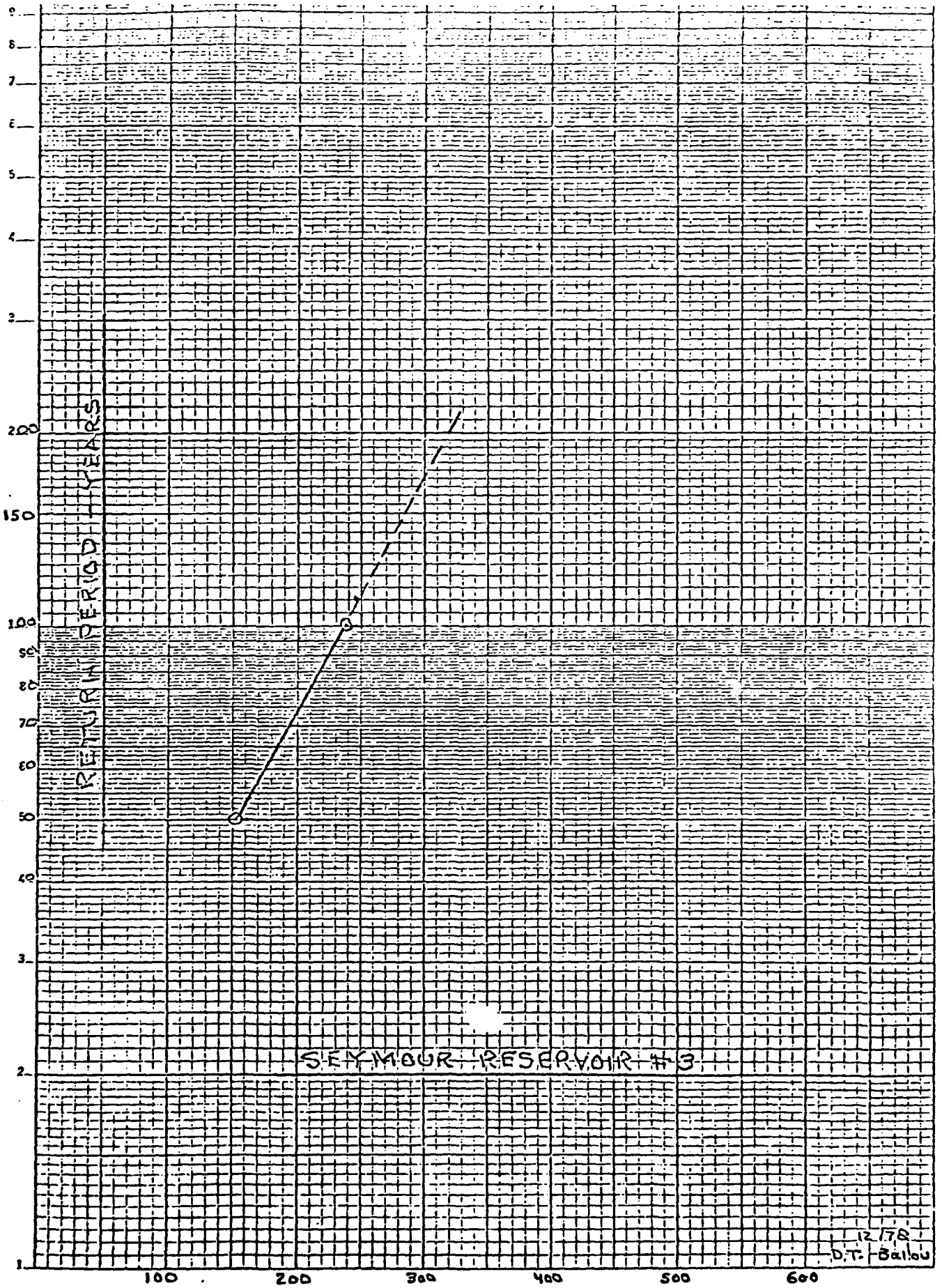
Visual inspection of the dam indicates generally good condition. This condition designation means the facility requires action within 2 to 3 years by the owner for the specific areas described.

Item that requires action is: Further investigation of the entire series of Seymour dams in respect to breaching and potential downstream damage to relatively new development on Pine Bridge Road.

Prepared by: Robert L. Jones, P.E.

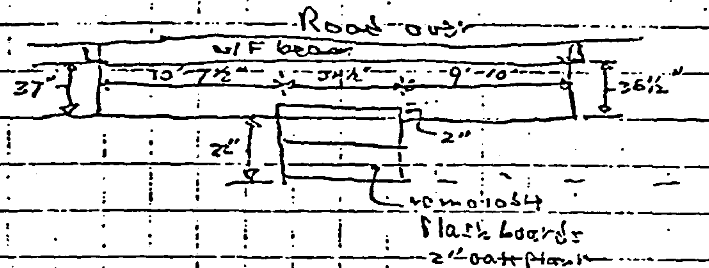
Project Engineer


HEAD ABOVE SPILLWAY CREST IN FEET
Bottom of Bridge
Top of Dam
249 cfs
327 cfs
Note - Flash boards in place
(add 15% without boards)
SEYMOUR RESERVOIR #3
SPILLWAY DISCHARGE - CFS

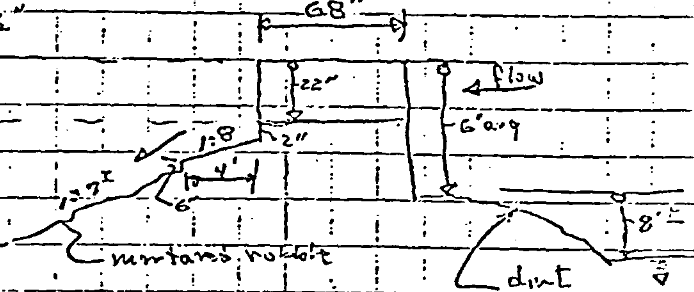

RETURN PERIOD IN YEARS
9
8
7
6
5
4
3
200
150
100
90
80
70
60
50
40
3
2
1
100
200
300
400
500
600
SEYMOUR RESERVOIR #3
12/78
D.T. Ballou

11/7/78
PTD

Seymour Reservoir #3



Looking U.S.

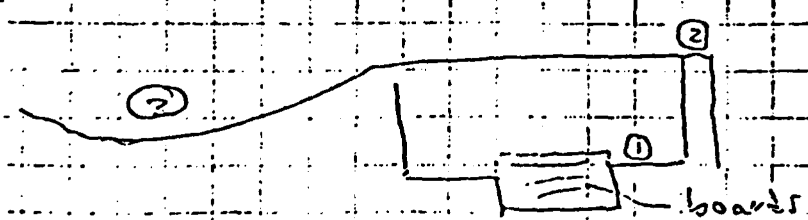


Section

11/25/78

Seymour Res. #3
Oxford Ct.

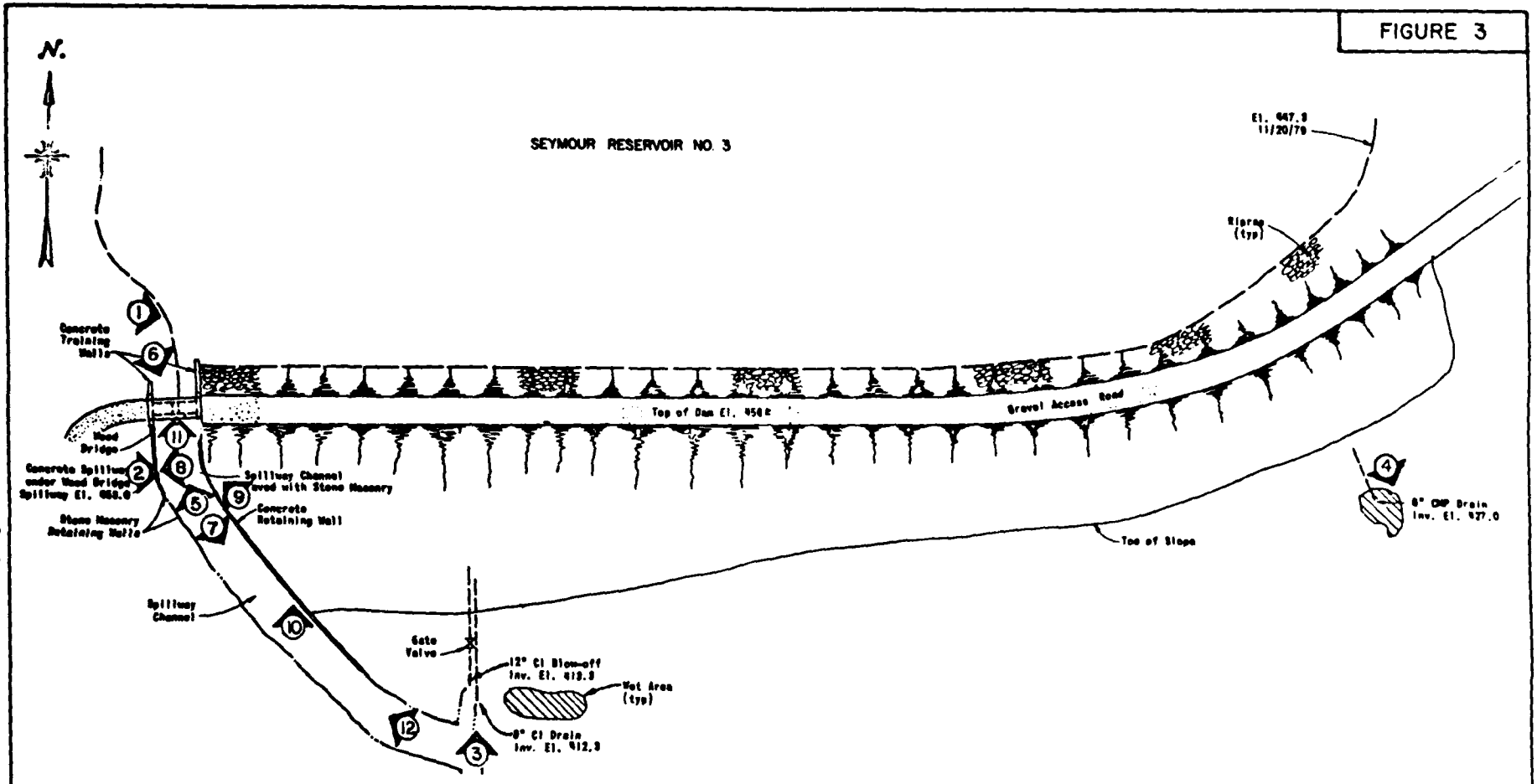
	BS	FS	Elev	
				Spwy crest
①	7.92			
②		3.06		Top of conc. & Emb top
③		5.42		Top of dam low point



APPENDIX C

PHOTOGRAPHS

FIGURE 3



Denotes Photo Number and Direction in which Photo was Taken

ROALD HAESTAD, INC. CONSULTING ENGINEERS WATERBURY, CONNECTICUT	US ARMY ENGINEER DIV NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS

NATIONAL PROGRAM OF INSPECTION OF NON-FED DAMS

PHOTO LOCATION PLAN

SEYMOUR RESERVOIR NO 3 DAM

OXFORD, CONNECTICUT

DRAWN	CHECKED	APPROVED	SCALES
JPS	DLS		

C-1

PHOTO NO. 1

UPSTREAM SLOPE OF DAM
NOTE DISPLACED RIPRAP AND EROSION
OF SLOPE ABOVE RIPRAP

PHOTO NO. 2

DOWNSTREAM SLOPE AS VIEWED
FROM SPILLWAY DISCHARGE CHANNEL

U.S ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASSACHUSETTS ROALD HAESTAD, INC. CONSULTING ENGINEERS WATERBURY, CONNECTICUT	NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS	SEYMOUR RES. NO. 3 DAM TR. TO HEMP SWAMP BROOK OXFORD, CONNECTICUT CT 00323 28 NOV '79

PHOTO NO. 3

DISCHARGE OF PIPE APPARENTLY CONNECTED TO UNDERDRAIN.
BLOWOFF PIPE AT LEFT.

PHOTO NO. 4

APPARENT UNDERDRAIN DISCHARGE
AT TOE OF DAM NEAR LEFT ABUTMENT

U.S ARMY ENGINEER DIV NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASSACHUSETTS ROALD HAESTAD, INC. CONSULTING ENGINEERS WATERBURY, CONNECTICUT	NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS	SEYMOUR RES. NO. 3 DAM TR. TO HEMP SWAMP BROOK OXFORD, CONNCECICUT CT 00323 28 NOV '79

PHOTO NO. 5

SPILLWAY, DISCHARGE CHANNEL
AND SERVICE BRIDGE

PHOTO NO. 6

UPSTREAM SIDE OF SPILLWAY
AND SERVICE BRIDGE

U.S.ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASSACHUSETTS	NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS	SEYMOUR RES. NO. 3 DAM TR. TO HEMP SWAMP BROOK OXFORD, CONNECTICUT CT 00323 28 NOV '79
ROALD HAESTAD, INC. CONSULTING ENGINEERS WATERBURY, CONNECTICUT		

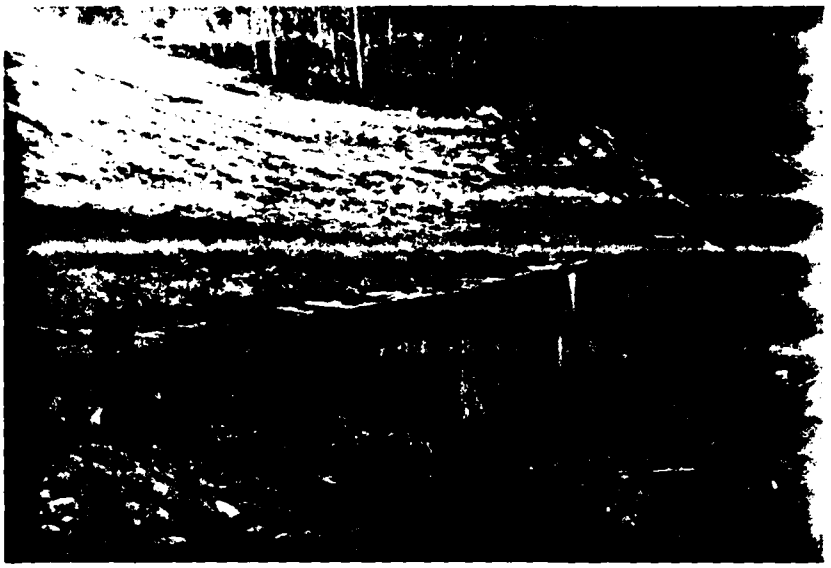


PHOTO NO. 7

CONCRETE PORTION OF LEFT WALL OF SPILLWAY DISCHARGE CHANNEL

PHOTO NO. 8

CRACK IN RIGHT WALL OF SPILLWAY DISCHARGE CHANNEL

U.S ARMY ENGINEER DIV NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASSACHUSETTS	NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS	SEYMOUR RES. NO. 3 DAM TR. TO HEMP SWAMP BROOK OXFORD, CONNECTICUT 00323 28 NOV '79
ROALD HAESTAD, INC. CONSULTING ENGINEERS WATERBURY, CONNECTICUT		

PHOTO NO. 9

DEPRESSION ADJACENT TO LEFT WALL OF SPILLWAY DISCHARGE CHANNEL

PHOTO NO. 10

SEEP NEAR TOP OF LEFT WALL OF SPILLWAY DISCHARGE CHANNEL

U S ARMY ENGINEER DIV NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASSACHUSETTS	NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS	SEYMOUR RES. NO. 3 DAM TR. TO HEMP SWAMP BROOK OXFORD, CONNECTICUT CT 00323 28 NOV '79
ROALD HAESTAD, INC. CONSULTING ENGINEERS WATERBURY, CONNECTICUT		

PHOTO NO. 11

SPILLWAY DISCHARGE CHANNEL BOTTOM
NOTE 1 FOOT DEEP CAVITY
INDICATED BY RULER

PHOTO NO. 12

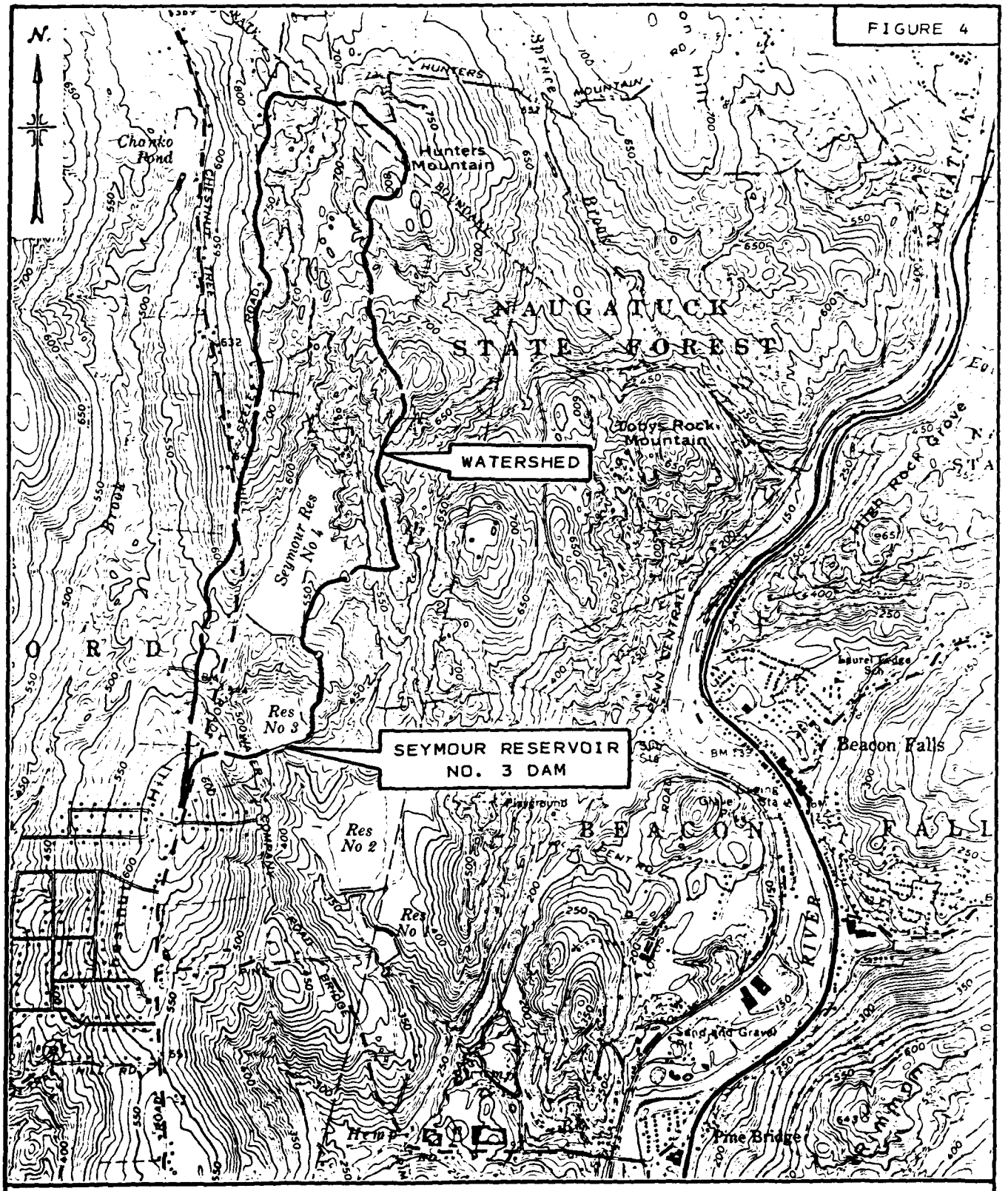
CHANNEL DOWNSTREAM OF SPILLWAY
SHOWING FLOW DUE TO SEEPAGE
INTO CHANNEL

U.S.ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASSACHUSETTS	NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS	SEYMOUR RES. NO. 3 DAM TR. TO HEMP SWAMP BROOK OXFORD, CONNECTICUT CT 00323 28 NOV '79
ROALD HAESTAD, INC. CONSULTING ENGINEERS WATERBURY, CONNECTICUT		

APPENDIX D

HYDROLOGIC AND HYDRAULIC COMPUTATIONS

FIGURE 4



WATERSHED PLAN

SEYMOUR RESERVOIR NO. 3 DAM
OXFORD, CONNECTICUT

SCALE: 1" = 2000'

ROALD HAESTAD, INC.

NAUGATUCK QUADRANGLE 1972

BY DLS DATE 1/3/80 **ROALD HAESTAD, INC.** SHEET NO 1 OF 25

CONSULTING ENGINEERS

CKD BY SL DATE 1/14/80 37 Brookside Road - Waterbury, Conn. 06708 JOB NO 049-07

SUBJECT SEYMOUR NO.3 SPILLWAY CAPACITY

SPILLWAY ELEV. = 453.0

SPILLWAY LENGTH = 23.5'

Coeff. @ Spillway = 2.8
Coeff. @ Crest = 2.7

FREEBOARD = 2.4 feet (TO LOW POINT OF EMBANKMENT CREST)

SPILLWAY CAPACITY W/ FLASHBOARDS $= CLH^{3/2} = 2.8(23.5)(2.4)^{3/2}$

$= 245$ CFS AT TOP OF DAM

SPILLWAY CAPACITY W/O FLASHBOARDS $= 2.8(2.9)(4.2)^{3/2} + 2.8(20.4)(2.4)^{3/2}$

$= 282$ CFS AT TOP OF DAM

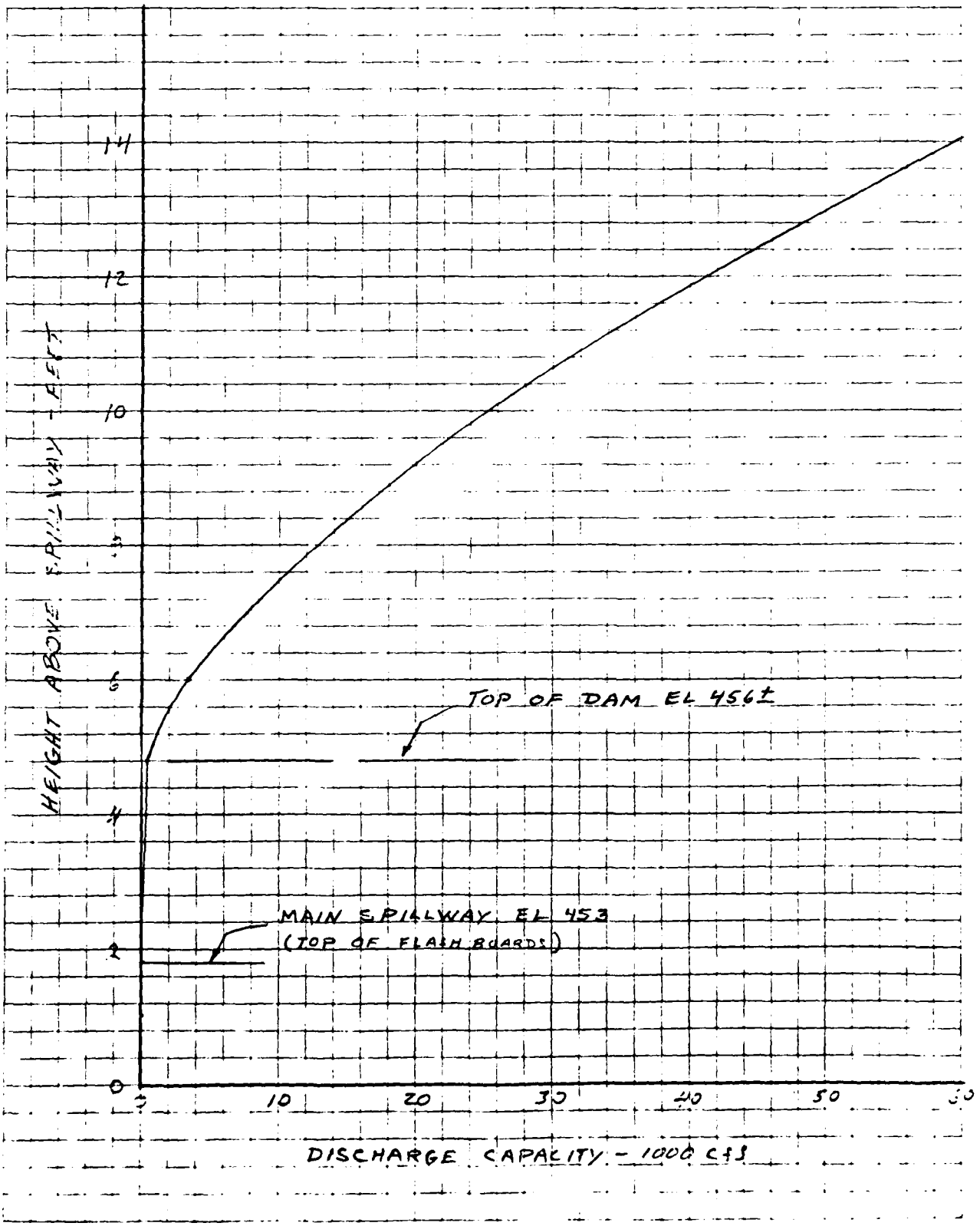
AVERAGE ELEV. TOP OF DAM = 456 (LOW POINT 455.4)
LENGTH OF DAM CREST @ EL. 456 = 750' Not Incl. Spillway
ASSUME BRIDGE LOST IN FLOOD

	DEPTH OF FLOW - FT	451.2 SPILLWAY SLOT	453.0 MAIN SPILLWAY	456.0 OVER CREST	TOTAL FLOW (CFS)
451.2	0				
	1	8	0	0	5
453.0	1.8	20	0	0	20
	3	42	75	0	117
	4	65	186	0	251
456.0	4.8	85	297	0	382
	6	119	491	2662	3272
	7	150	677	6,608	7,435
	8	184	882	11,592	12,658
	10	257	1341	24,012	25,610
	12	338	1561	39,122	41,321
	14	425	1424	56,508	59,367

BY DLS DATE 1/3/80 **ROALD HAESTAD, INC.** SHEET NO 2 OF 25

CKD BY SL DATE 1/14/80 CONSULTING ENGINEERS
37 Brookside Road - Waterbury, Conn. 06708 JOB NO 042-07

SUBJECT SEYMOUR NO. 3 - SPILLWAY CAPACITY W/O Flashboards



BY ...D.A.C.... DATE ..1/3/80... **ROALD HAESTAD, INC.** SHEET NO ...3..... OF ..26

CONSULTING ENGINEERS

CKD BY ..S.L. DATE ..4.9.80.... 37 Brookside Road - Waterbury, Conn. 06708 JOB NO ...2.4.2.-.0.2.....

SUBJECT .....SEYMOUR NO. 3 - SPILLWAY CAPACITY.....

SPILLWAY CAPACITY WITH FLASHBOARDS

ASSUME BRIDGE LOST IN FLOOD

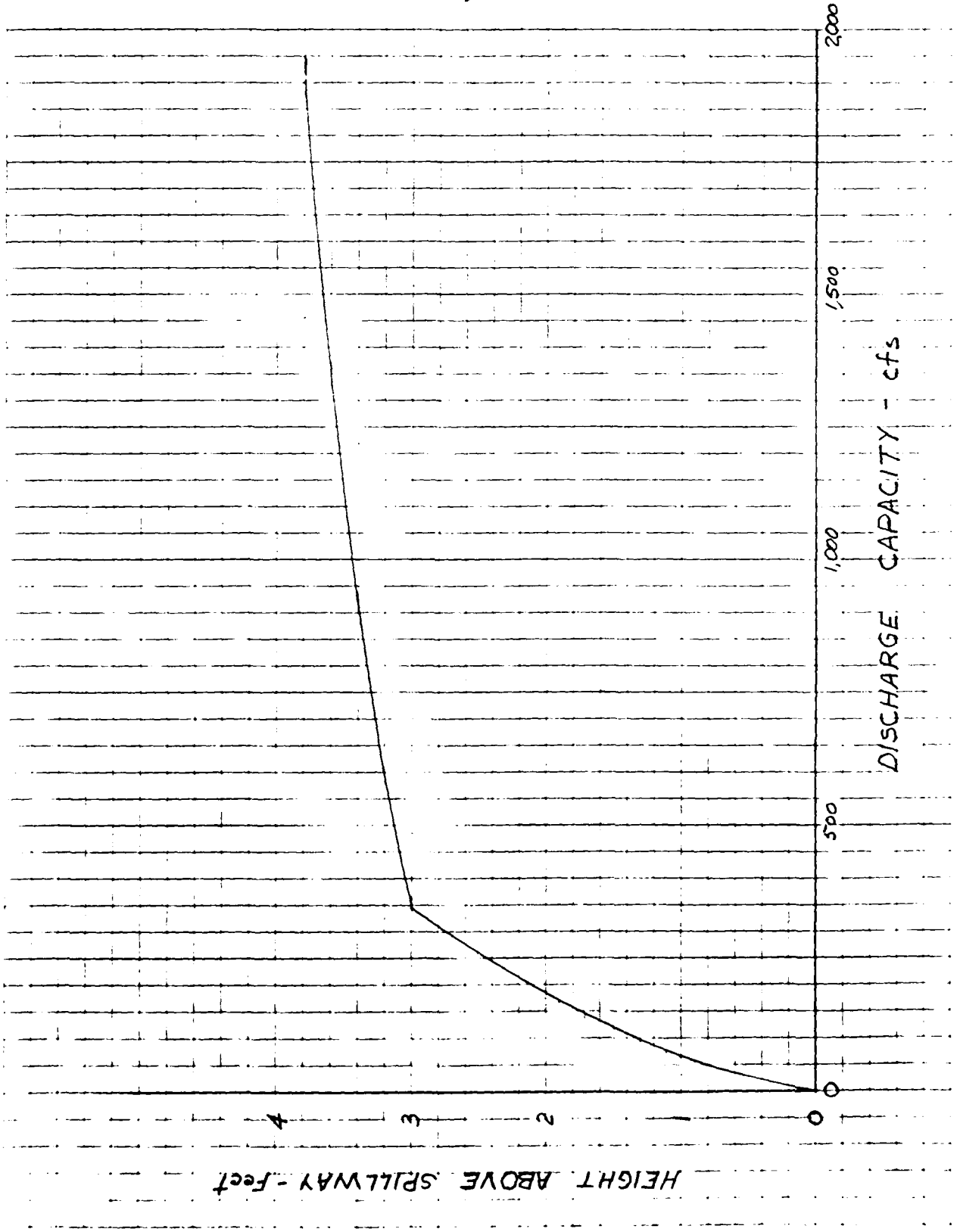
DEPTH OF FLOW - FT.	SPILLWAY	OVER CREST	TOTAL FLOW - CFS
1	66	0	66
2	186	0	186
3	342	0	342
4	526	2025	2,551
5	736	5728	6,464
6	967	10,522	11,489
7	1219	16,200	17,419
8	1489	22,640	24,129
10	2091	37,504	39,585
12	2735	54,675	57,410
14	3447	73,878	77,325

BY S.L. DATE 11/9/80 **ROALD HAESTAD, INC.** SHEET NO 4 OF 25

CONSULTING ENGINEERS

CKD BY D.S. DATE 11/21/80 37 Brookside Road - Waterbury, Conn. 06708 JOB NO 049-07

SUBJECT SEYMOUR NO. 3 - Spillway Capacity W/Flashboards



BY DLS DATE 1/14/80 **ROALD HAESTAD, INC.** SHEET NO 5 OF 25

CONSULTING ENGINEERS

CKD BY SL DATE 1/14/80 37 Brookside Road - Waterbury, Conn. 06708 JOB NO 049-07

SUBJECT SEYMOUR NO. 3 - AREA-CAPACITY

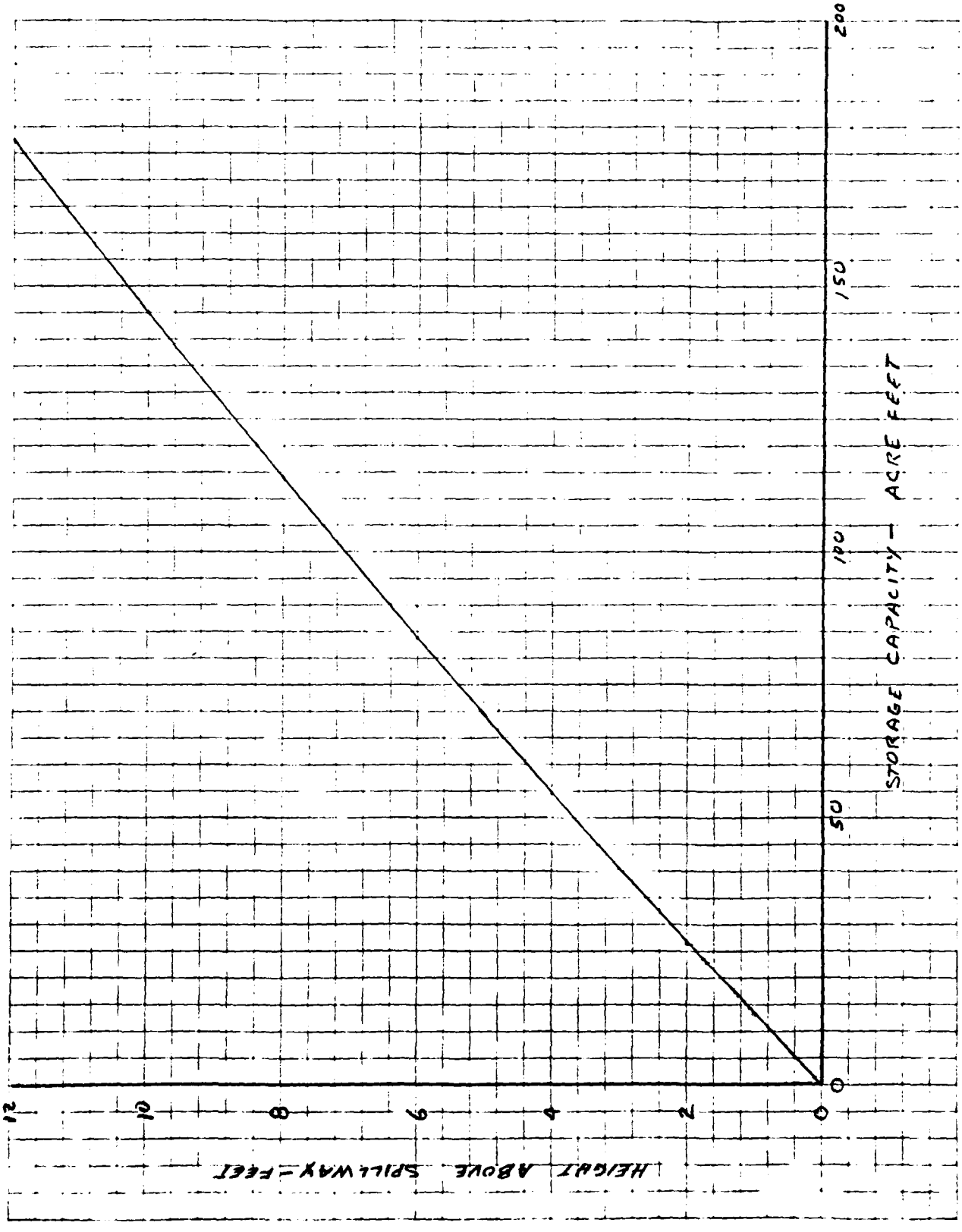
Elev.	HEIGHT ABOVE SPILLWAY - FT.	SURFACE AREA - ACRES	AVE. SURFACE AREA - ACRES	STORAGE CAPACITY - AC-FT.
453	0	13		
			13	
	1	13		13
			13.5	
	2	14		26.5
			14	
	3	14		40.5
			14	
	4	14		54.5
			14.5	
	5	15		69
			15	
459	6.	15		84
			15	
	8	15		114
			15.5	
	10	16		145
			16	
	12	16		177
			16.5	
	14	17		210
			17.5	
470	16.	18		245

BY ...RAS... DATE ...1/9/80... **ROALD HAESTAD, INC.** SHEET NO ...6... OF ...25...

CONSULTING ENGINEERS

CKD BY ...S.A... DATE ...1/14/80... 37 Brookside Road - Waterbury, Conn. 06708 JOB NO ...049-07...

SUBJECT ...SEYMOUR NO. 3 STORAGE - CAPACITY CURVE...



BY JLS DATE 1/23/80 **ROALD HAESTAD, INC.** SHEET NO 7 OF 25
CONSULTING ENGINEERS
CKD BY SL DATE 1/28/80 37 Brookside Road - Waterbury, Conn. 06708 JOB NO 049-07
SUBJECT SEYMOUR NO. 3 - TEST FLOOD - ½ PMF

THE TEST FLOOD ROUTING FOR SEYMOUR NO. 3 WAS DEVELOPED BY CALCULATING AN INFLOW HYDROGRAPH FOR SEYMOUR NO. 4, ROUTING THE FLOOD THROUGH THE RESERVOIR AND ADDING THE OUTFLOW TO THE INFLOW FOR SEYMOUR NO. 3.

THE COMPUTATIONS BELOW ARE BASED ON THE SPILLWAY CAPACITY BEFORE OVERTOPPING THE LOW POINT OF THE DAM.

PEAK OUTFLOW FOR SEYMOUR NO. 3 = 185 cfs

SPILLWAY CAPACITY = 280 cfs W/O FLASHBOARDS

OR $\frac{280}{185} \times 100 = 151\%$ OF THE TEST FLOOD

SPILLWAY CAPACITY = 245 cfs W/ FLASHBOARDS

OR $\frac{245}{185} \times 100 = 132\%$ OF THE TEST FLOOD

SUBJECT SEYMOUR RES. NO.4 DAM - TEST FLOOD - ½ PMF

TEST FLOOD = ½ PMF

DRAINAGE AREA = 343 ACRES = 0.54 Sq. Mi.

FROM CORPS OF ENG. CHART FOR "ROLLING" TERRAIN

MPF = 2,125 cfs / sq. Mi (2.0 Sq. Mi. MINIMUM)

PMF = 2,125 x 0.54 sq. mi. = 1148 CFS

½ PMF = ½ (1148) = 574 CFS

USE VOLUME OF RUNOFF = 9.5" = 274 Ac-Ft.

FROM DESIGN OF SMALL DAMS

$$q_p = \frac{484 A Q}{T_p} \qquad T_b = 2.67 T_p$$

q_p = PEAK RATE OF RUNOFF - CFS

A = DRAINAGE AREA - Sq. Mi.

Q = TOTAL RUNOFF IN INCHES

T_p = TIME IN HOURS FROM START OF RISE TO PEAK

T_b = TIME BASE OF HYDROGRAPH IN HOURS

$$574 = \frac{484 (0.54)(9.5)}{T_p}$$

T_p = 4.3 HOURS

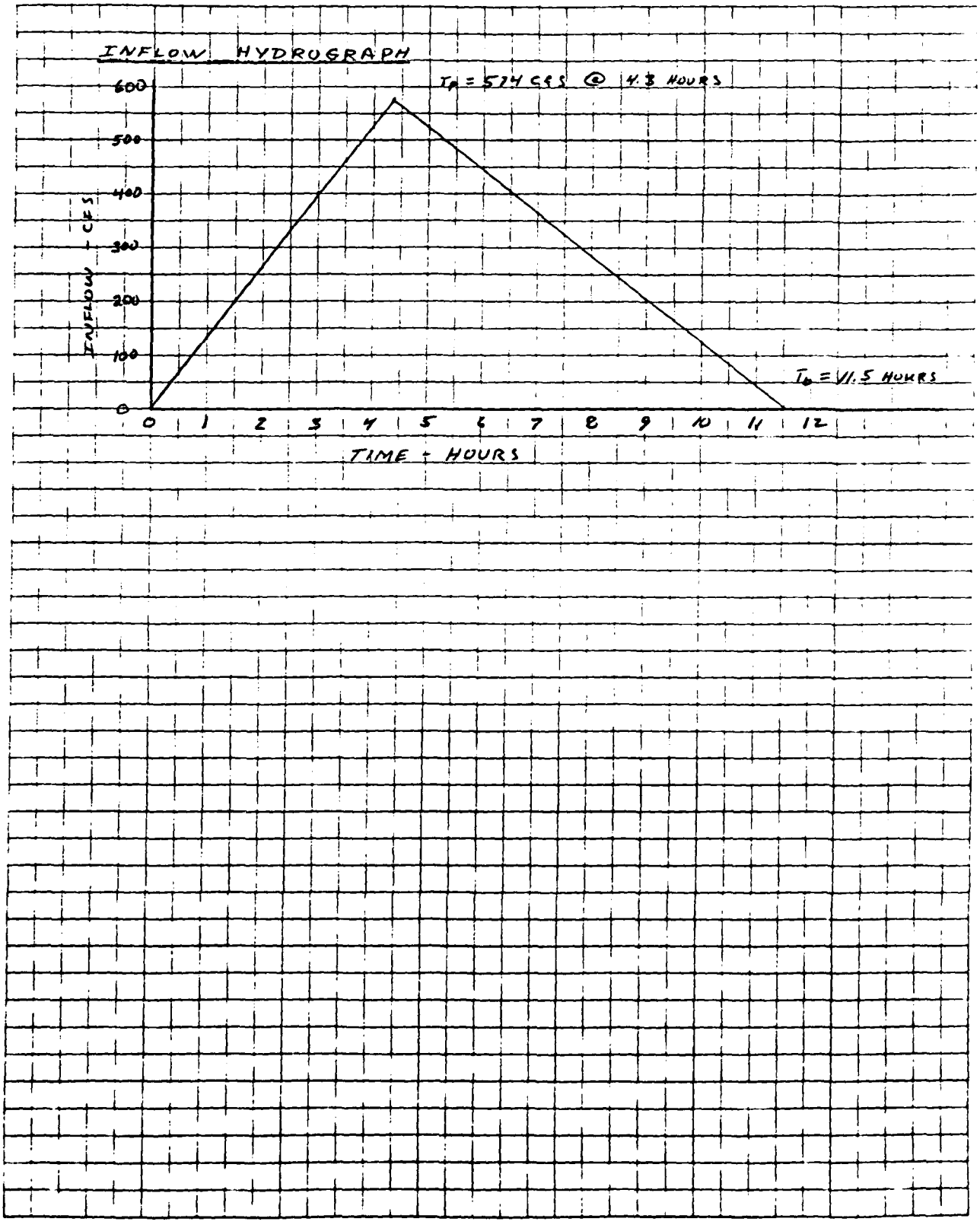
T_b = 2.67 (4.3) = 11.5 HOURS

BY DLS DATE 1/8/80 **ROALD HAESTAD, INC.** SHEET NO 9 OF 25

CONSULTING ENGINEERS

CKD BY DH DATE 1/14/80 37 Brookside Road - Waterbury, Conn. 06708 JOB NO 042-12

SUBJECT SEYMOUR NO. 4 - TEST FLOOD - ½ PMF



ROALD HAESTAD, INC.
CONSULTING ENGINEERS

BY: SL DATE: 1/9/80 — SHEET NO. 10 OF 25

CHKD. BY: DLS DATE: 1/11/80 — JOB NO. 049-12

SUBJECT: SEYMOUR NO. 4 - Flood Routing

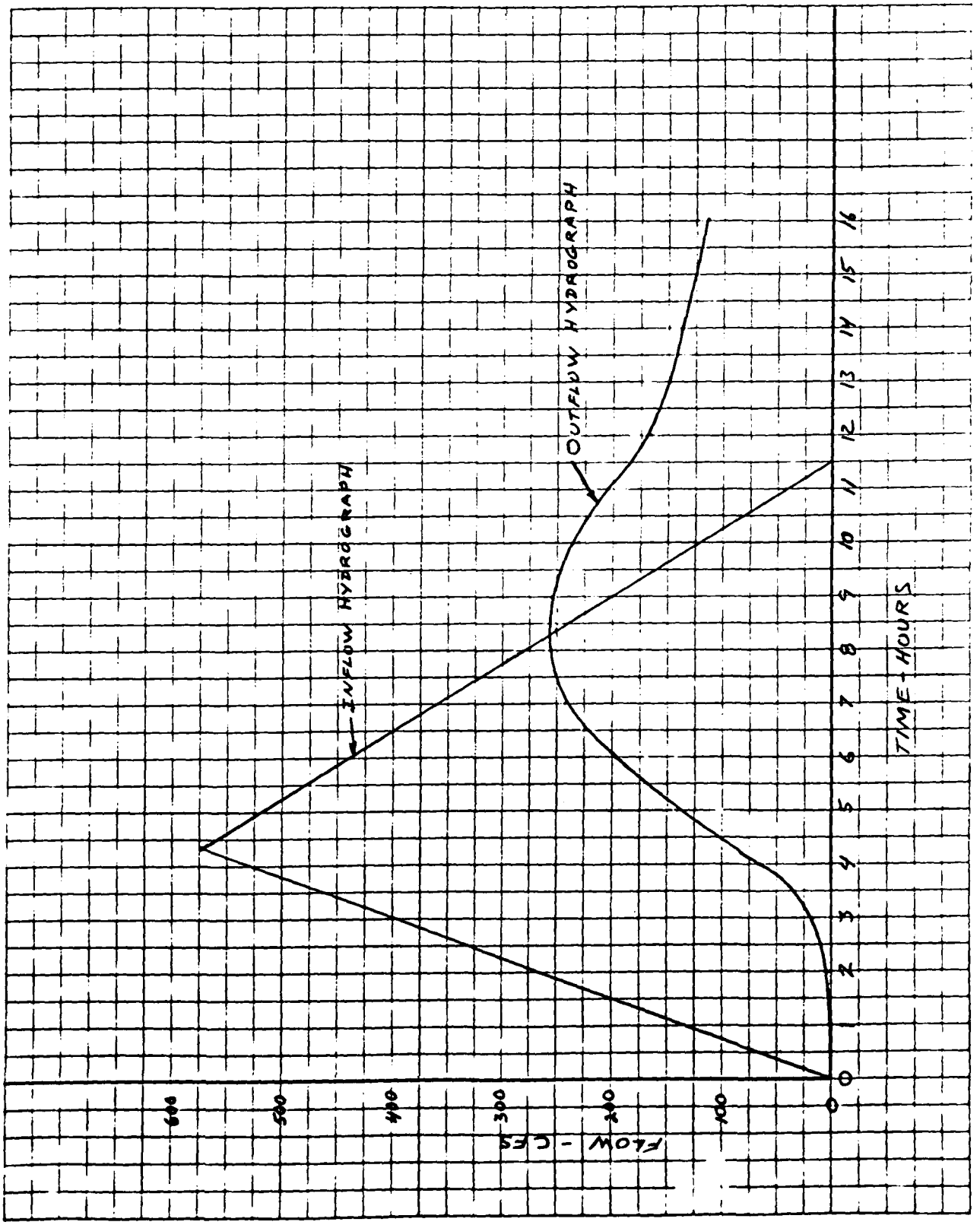
TIME HOURS	ΔT HOURS	AVERAGE RATE OF INFLOW Q_i Δt SEC.FT.	AVERAGE INFLOW ACRE-FEET	TRIAL RES. STORAGE EL. END OF Δt	AVERAGE RATE OF OUTFLOW Q_o SEC.FT.	AVERAGE OUTFLOW FOR Δt ACRE-FEET	INCREMENTAL STORAGE, ΔS ACRE-FEET	TOTAL STORAGE ACRE-FEET	RESERVOIR ELEVATION END OF Δt
0		0			0			0	
	1	65	5.4	~~532.2~~	~~1~~	~~0~~	~~5.4~~	~~5.4~~	~~532.1~~
1				532.1	1	0	5.4	5.4	532.1
	1	200	16.5	532.5	3	0	16.5	21.9	532.5
2									
	1	335	27.7	~~533.0~~	~~7~~	~~1~~	~~26.7~~	~~48.6~~	~~533.2~~
3				533.2	9	1	26.7	48.6	533.2
	1	463	38.3	~~533.5~~	~~21~~	~~2~~	~~36.3~~	~~84.9~~	~~534.0~~
4				534.0	38	3	35.3	83.9	534.0
	1	540	44.6	~~535.0~~	~~109~~	~~9~~	~~35.6~~	~~119.5~~	~~534.9~~
5				534.9	104	9	35.6	119.5	534.9
	1	485	40.1	~~536.0~~	~~205~~	~~17~~	~~23.1~~	~~142.6~~	~~535.4~~
6				535.4	170	14	26.1	145.6	535.4
	1	405	33.5	~~535.5~~	~~201~~	~~17~~	~~16.5~~	~~160.1~~	~~535.8~~
7				535.8	218	18	15.5	159.1	535.8
	1	320	26.4	~~535.7~~	~~235~~	~~20~~	~~6.4~~	~~165.5~~	~~535.9~~
8				535.9	247	21	5.4	164.5	535.9
	1	240	19.8	~~535.8~~	~~247~~	~~21~~	~~-1.2~~	~~163.3~~	~~535.9~~
9				535.9	253	21	-1.2	163.3	535.9
	1	160	13.2	~~535.8~~	~~247~~	~~21~~	~~7.8~~	~~155.5~~	~~535.7~~
10				535.7	242	20	-6.8	156.5	535.7
	1	85	7.0	~~535.6~~	~~224~~	~~19~~	~~-12.0~~	~~144.5~~	~~535.5~~
11				535.5	219	18	-11.0	145.5	535.5
	1	12	1.0	~~535.0~~	~~181~~	~~15~~	~~-14.0~~	~~131.5~~	~~535.1~~
12				535.1	186	16	-15.0	130.5	535.1
	2	0	0	~~534.9~~	~~155~~	~~13~~	~~-13.0~~	~~117.5~~	~~534.8~~
14				534.8	149	12	-12.0	118.5	534.8
	2	0	0	~~534.5~~	~~119~~	~~10~~	~~-10.0~~	~~108.5~~	~~534.6~~
16				534.6	124	10	-10.0	108.5	534.6

BY D.A.S. DATE 1/10/80 **ROALD HAESTAD, INC.** SHEET NO 11 OF 25

CONSULTING ENGINEERS

CKD BY S.L. DATE 1/11/80 37 Brookside Road - Waterbury, Conn. 06708 JOB NO 049-12

SUBJECT SEYMOUR NO. 4 - FLOOD ROUTING



BY RAS DATE 1/2/80 **ROALD HAESTAD, INC.** SHEET NO 12 OF 25

CONSULTING ENGINEERS

CKD BY SL DATE 1/15/80 37 Brookside Road - Waterbury, Conn. 06708 JOB NO 049-07

SUBJECT SEYMOUR NO. 3 - TEST FLOOD ½ PMF

DRAINAGE AREA = 432 ACRES = 0.68 Sq. mi.
= 0.54 (SEYMOUR NO.4) + 0.14 (SEYMOUR No. 3)

FROM CORPS OF ENGINEERS CHART "ROLLING" TERRAIN

MPF = 2125 cfs/sq. mi. (2.0 Sq. mi. minimum)

PMF = 2125 x 0.14 sq. mi. = 298 cfs

½ PMF = ½ x 298 = 149 cfs

USE DEPTH OF RUNOFF = 19"/2 = 9.5"

VOLUME OF RUNOFF = 0.14 sq. mi x 640 Ac/sq. mi. x 9.5"/12"/ft.

V = 71 Ac-Ft.

FROM DESIGN OF SMALL DAMS

$$q_p = \frac{484AQ}{T_p} \qquad T_b = 2.67\,T_p$$

q_p = PEAK RATE OF RUNOFF - CFS
A = DRAINAGE AREA - Sq. mi.
Q = TOTAL RUNOFF - INCHES
T_p = TIME IN HOURS FROM START OF RISE TO PEAK
T_b = TIME BASE OF HYDROGRAPH IN HOURS

$$149 = \frac{484(0.14)(9.5)}{T_p}$$

T_p = 4.3 HOURS

$T_b = 2.67\,(4.3) = 11.5$ HOURS

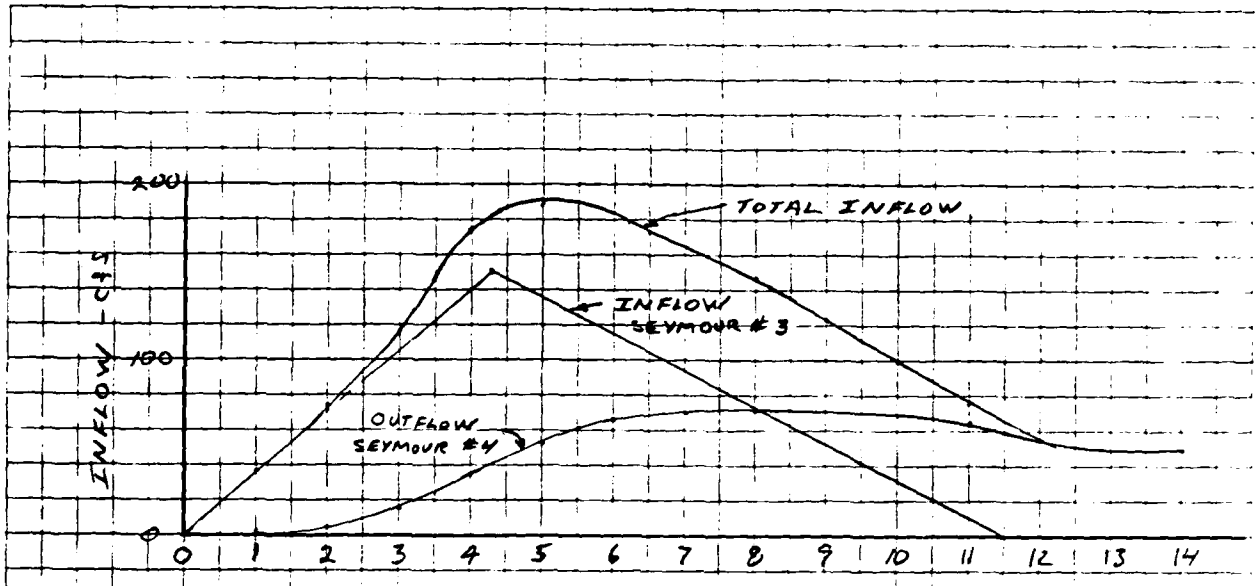
THE ABOVE HYDROGRAPH IS FOR SEYMOUR NO. 3 WATERSHED. ROUTED OUTFLOW FROM SEYMOUR NO. 4 MUST BE ADDED TO GET TOTAL INFLOW.

BY ..R.L.S..... DATE ..1/28/80.. **ROALD HAESTAD, INC.** SHEET NO ....13.... OF ....25....

CONSULTING ENGINEERS

CKD BY ..S.L DATE ..1/28/80.. 37 Brookside Road - Waterbury, Conn. 06708 JOB NO ....049-07....

SUBJECT ..... SEYMOUR NO. 3 - INFLOW HYDROGRAPH - ½ PMF .....



PEAK INFLOW = 190 CFS

BY DLS DATE 1/28/80 ROALD HAESTAD, INC. SHEET NO. 14 OF 25
CONSULTING ENGINEERS
CHKD BY SL DATE 1/28/80 JOB NO. 049-07
SUBJECT SEYMOUR NO. 3 DAM - FLOOD ROUTING - ½ PMF
WITH FLASH BOARDS

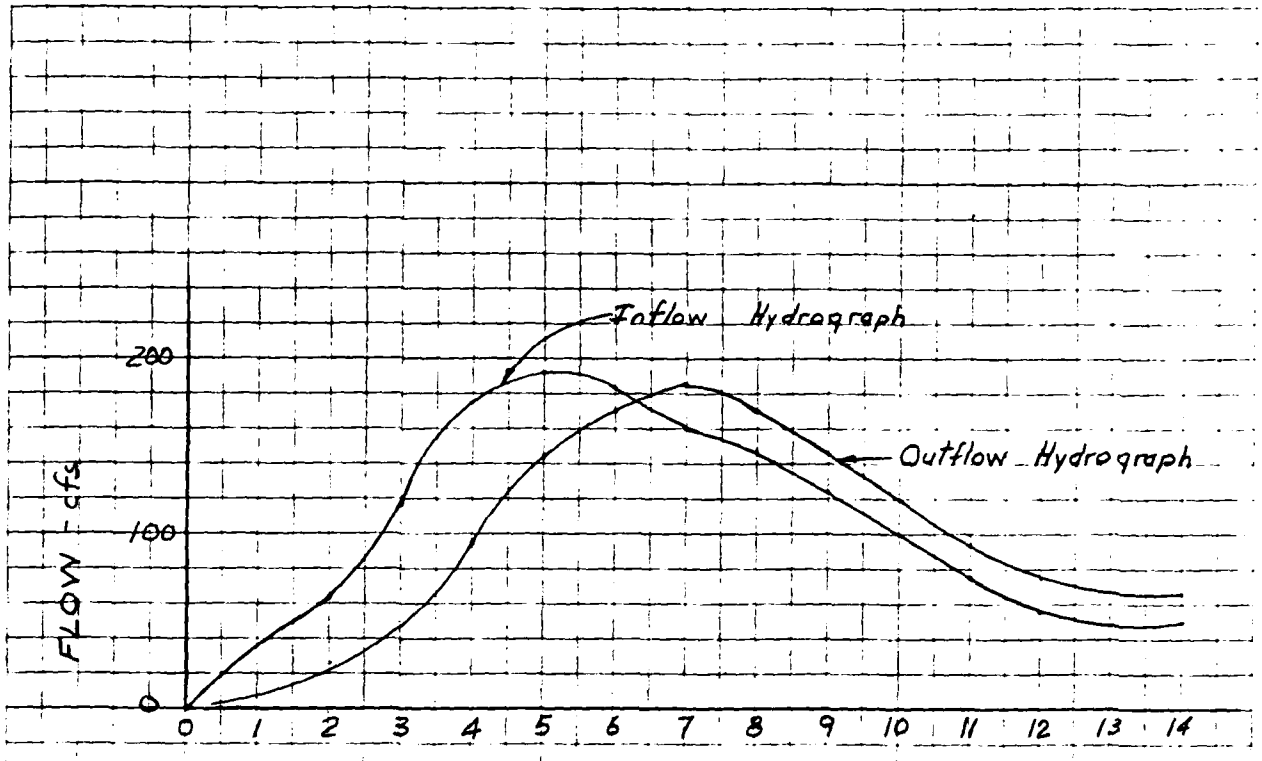
TIME HOURS	ΔT HOURS	AVERAGE RATE OF INFLOW Qi Δt	SEC-FT.	AVERAGE INFLOW ACRE-FEET	TRIAL RES. STORAGE EL. END OF Δt	AVERAGE RATE OF OUTFLOW Qo	SEC-FT.	AVERAGE OUTFLOW FOR Δt ACRE-FEET	INCREMENTAL STORAGE, ΔS ACRE-FEET	TOTAL STORAGE ACRE-FEET	RESERVOIR ELEVATION END OF Δt
0			0				0			0	
1	1	18		1.5	4530	0	0	0	1.5	1.5	4531
2	1	55		4.5	4534	25	13	1	3.5	5.0	4534
3	1	95		7.9	4537	40	33	3	4.9	9.9	4537
4	1	145		12.0	4542	85	63	5	7.0	16.9	4543
5	1	181		15.0	4546	125	108	9	6.0	22.9	4547
6	1	186		15.4	4548	130	145	12	3.4	26.3	4549
7	1	172		14.2	4549		165	14	0.2	26.5	4550
8	1	154		12.7	4548	120	165	14	-1.3	25.2	4549
9	1	135		11.2	4547	110	153	13	-1.8	23.4	4547
10	1	111		9.2	4546	130	138	12	-2.8	20.6	4545
11	1	87		7.2	4544	110	120	10	-2.8	17.8	4543
12	1	66		5.5	4542	85	98	8	-2.5	15.3	4541
14	2	54		4.5	4540		75	6	-1.5	13.8	4540
16	2	48		4.0	4539		63	5	-1.0	12.8	4540

BY SL DATE 1/28/80 **ROALD HAESTAD, INC.** SHEET NO 15 OF 25

CONSULTING ENGINEERS

CKD BY DLS DATE 1/28/80 37 Brookside Road - Waterbury, Conn. 06708 JOB NO 049-07

SUBJECT SEYMOUR NO 3 - Flood Routing - ½ PMF



S = Reservoir storage at time of failure = Storage at Spillway Level + Freeboard Storage

$$S = \left[67{,}000{,}000 \text{ gal} \times \frac{1 \text{ acre-ft}}{325{,}851 \text{ gal}}\right] + \left[13 \text{ acres} \times 3 \text{ ft}\right]$$

$S = 205.6$ acre-ft + 39 acre-ft

$S = 244.6$ use 245 acre-ft

Q_{pl} = Peak Failure Outflow = $\frac{8}{27} W_b \sqrt{g}\, Y_o^{3/2}$

W_b = Breach Width = 40% of dam length at mid height
$W_b = (0.4)(500) = 200$ ft

Y_o = Total height from river bed to pool level at failure = 42 ft

$Q_{pl} = \frac{8}{27}(200)(\sqrt{32.2})(42)^{3/2} = 91{,}529$ say 91,500 cfs

SECTION NO. 1 (SEYMOUR NO. 2 DAM)

$V_1 = 317$ acre-ft $H_1 = 13.8$ ft.

V_1 is greater than 1/2 of S

Water discharging at a rate equal to Q_{pl} would empty Seymour No. 3 in approximately 2 min. Therefore, it can be assumed that the water will fill Seymour No. 2 with very little outflow during the time period.

Assumption: 1) The water level in Seymour No. 2 will rise to a point 10 feet above the spillway elevation.

Continued:

Thus $H = 10$ ft

$Q_{P2} = 33{,}000$ cfs

SECTION NO 2: (Seymour No 1 Spillway)

$Q_{P2} = 33{,}000$ cfs

$H_2 = 12.7$ ft ✓

$V_2 = 127$ acre-ft

$Q_{P3}(TRIAL) = Q_{P2}(1 - V_2/S)$

$Q_{P3}(TRIAL) = 33{,}000 \text{ cfs}\,(1 - 127/245)$

$Q_{P3}(TRIAL) = 15{,}895$ cfs

$H_3 = 8.9$ ft

$V_3 = 78$ acre-ft

$V_{ave} = \frac{V_3 + V_2}{2} = \frac{78 + 127}{2} = 102.5$ acre-ft

$Q_{P3} = Q_{P2}(1 - V_{ave}/S)$

$Q_{P3} = 33{,}000 \text{ cfs}\,(1 - 102.5/245)$

$Q_{P3} = 19{,}195$ cfs $\qquad H_3 = 9.7$ ft

OVERTOPS SEYMOUR NO. 1 BY 7.7'

SECTION NO 3: (SEE FIGURE 5A) Reach Length = 1,050 ft

$Q_{P3} = 19{,}195$ cfs

$H_3 = 12.5$ ft $\qquad (Area)_3 = 1{,}040$ sq ft

$V_3 = (Area)_3 \times Length$

$V_3 = \left[1{,}040 \text{ ft}^2 \times 1{,}050 \text{ ft}\right] \times \frac{1 \text{ acre-ft}}{43{,}560 \text{ ft}^3} = 25.07$ use 25 acre-ft

V_3 is less than 1/2 of S ∴ Reach is O.K.

$Q_{P4}(TRIAL) = Q_{P3}(1 - V_3/S)$

$Q_{P4}(TRIAL) = 19,195 \text{ cfs}(1 - 25/245)$

$Q_{P4}(TRIAL) = 17,236 \text{ cfs}$

$H_4 = 12.0 \text{ ft}$ $(Area)_4 = 960 \text{ sq ft}$

$V_4 = (Area)_4 \times Length$

$V_4 = \left[960 \text{ ft}^2 \times 1,050 \text{ ft}\right] \times \frac{1 \text{ acre-ft}}{43,560 \text{ ft}^3} = 23.14$ use 23 acre-ft

$V_{ave} = \frac{V_4 + V_3}{2} = \frac{23 + 25}{2} = 24$ acre-ft

$Q_{P4} = Q_{P3}(1 - V_{ave}/S)$

$Q_{P4} = 19,195 \text{ cfs}(1 - 24/245)$

$Q_{P4} = 17,315 \text{ cfs}$ $H_4 = 12.2 \text{ ft}$

SECTION NO 4: Reach Length = 2,600 ft

$Q_{P4} = 17,315 \text{ cfs}$

$H_4 = 11.0 \text{ ft}$ $(Area)_4 = 1,150 \text{ sq ft}$

$V_4 = (Area)_4 \times Length$

$V_4 = \left[1,150 \text{ ft}^2 \times 2,600 \text{ ft}\right] \times \frac{1 \text{ acre-ft}}{43,560 \text{ ft}^3} = 68.64$ use 69 acre-ft

V_4 is less than 1/2 of S ∴ Reach is O.K.

$Q_{P5}(TRIAL) = Q_{P4}(1 - V_4/S)$

$Q_{P5}(TRIAL) = 17,315 \text{ cfs}(1 - 69/245)$

$Q_{P5}(TRIAL) = 12,440 \text{ cfs}$

Q_{P5} (TRIAL) = 12,440 cfs

H_5 = 9.6 ft (Area)$_5$ = 900 sq ft

V_5 = (Area)$_5$ x Length

$$V_5 = \left[900\,ft^2 \times 2{,}600\,ft\right] \times \frac{1\,acre\text{-}ft}{43{,}560\,ft^3} = 53.7 \text{ use } 54 \text{ acre-ft}$$

$$V_{ave} = \frac{V_5 + V_4}{2} = \frac{54 + 69}{2} = 61.5 \text{ acre-ft}$$

$$Q_{P5} = Q_{P4}\,(1 - V_{ave}/S)$$

$$Q_{P5} = 17{,}315 \text{ cfs}\,(1 - 61.5/245)$$

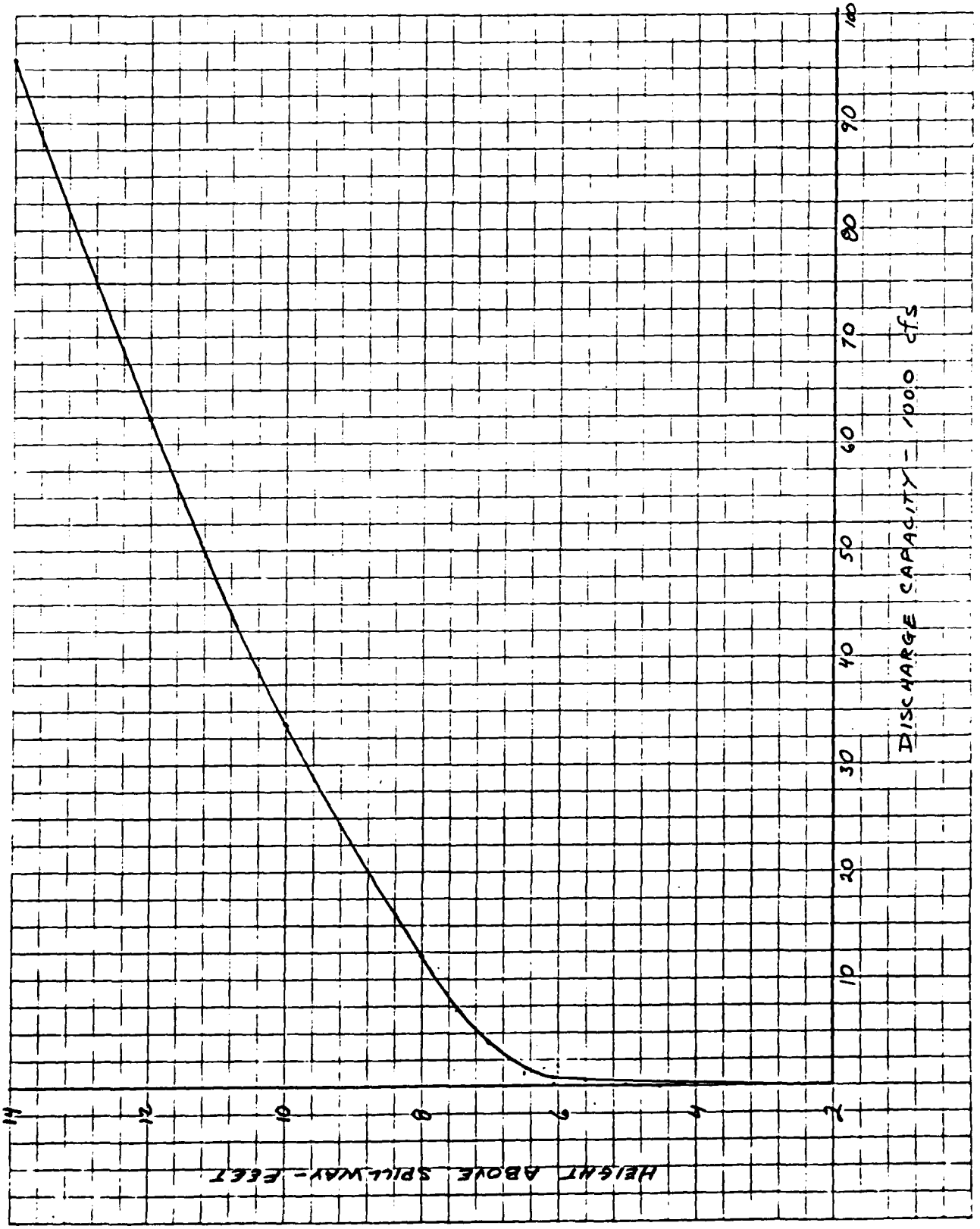
Q_{P5} = 12,970 cfs H_5 = 9.8 ft

BY DLS DATE 1/10/80 **ROALD HAESTAD, INC.** SHEET NO 20 OF 25

CONSULTING ENGINEERS

CKD BY SL DATE 1/14/80 37 Brookside Road - Waterbury, Conn. 06708 JOB NO 049-08

SUBJECT SEYMOUR NO. 2 - SPILLWAY CAPACITY W/O Flashboards



BY DLS DATE 1/7/80 **ROALD HAESTAD, INC.** SHEET NO 21 OF 25

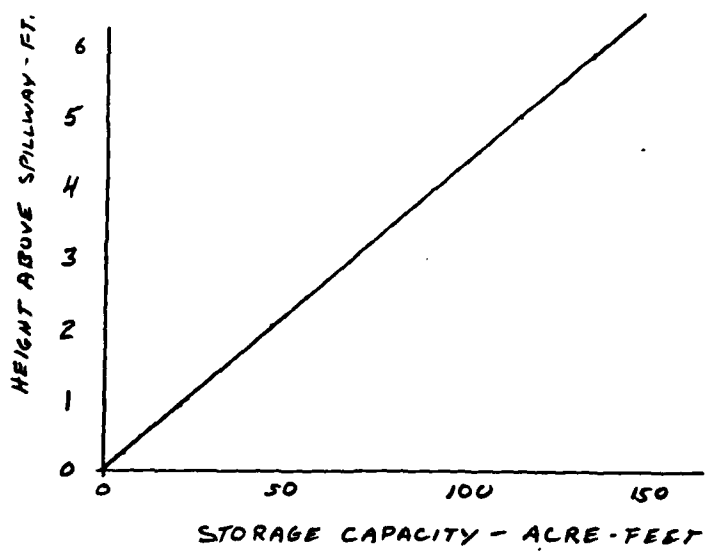
CONSULTING ENGINEERS

CKD BY SH DATE 1/14/80 37 Brookside Road - Waterbury, Conn. 06708 JOB NO 042-08

SUBJECT SEYMOUR NO. 2 — STORAGE - CAPACITY

WATER SURFACE AREA ASSUMED CONSTANT AT 23.0 ACRES, DEPTH OF SURCHARGE STORAGE IS EXPECTED TO BE SMALL.

HEIGHT ABOVE SPILLWAY - FEET	STORAGE CAPACITY ACRE - FEET
1	23
2	46
3	69
4	92
5	115

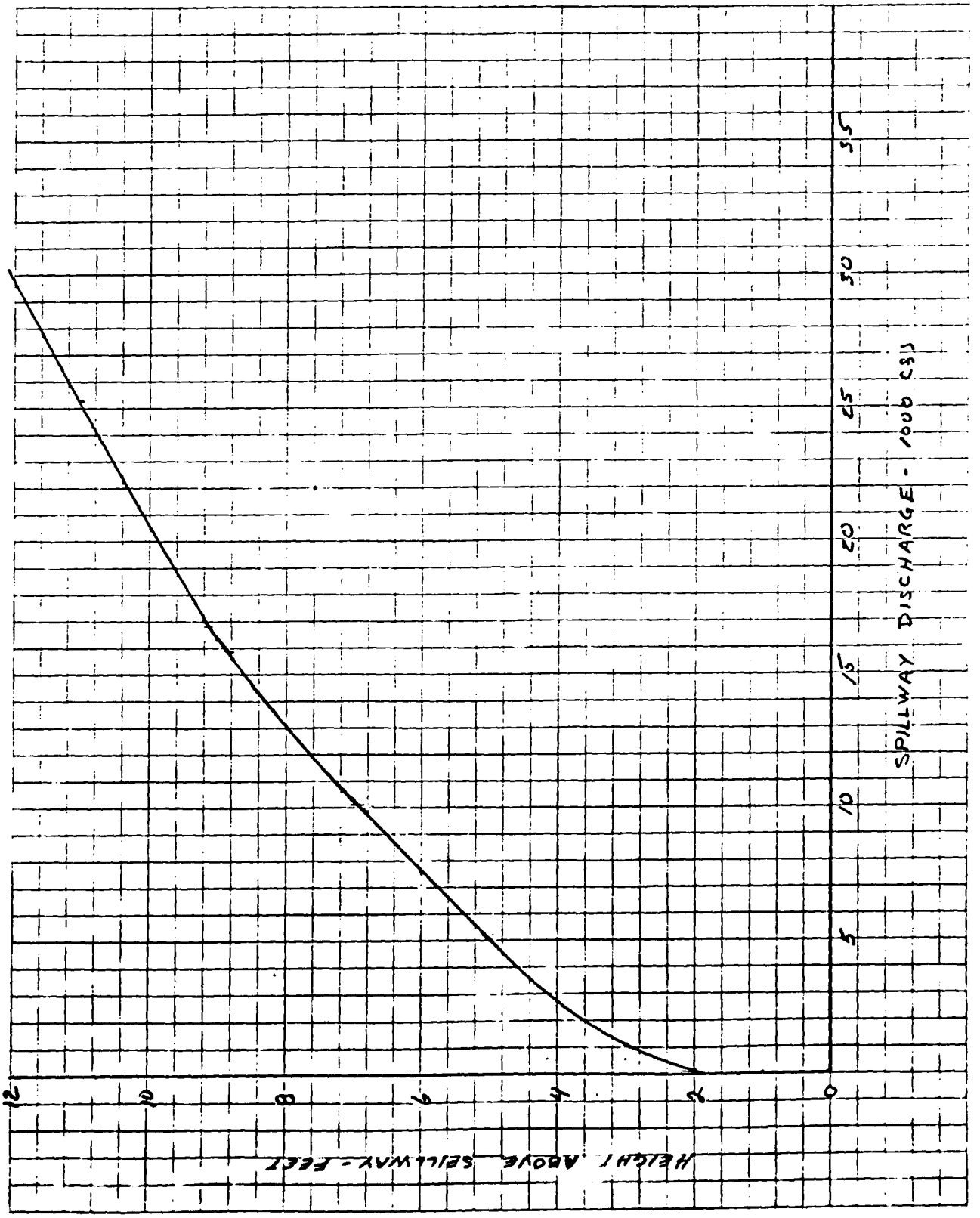


BY D.L.S. DATE 1/7/80 **ROALD HAESTAD, INC.** SHEET NO 22 OF 25

CONSULTING ENGINEERS

CKD BY S.L. DATE 1/14/80 37 Brookside Road - Waterbury, Conn. 06708 JOB NO 049-09

SUBJECT SEYMOUR NO. 1 - SPILLWAY DISCHARGE CURVE

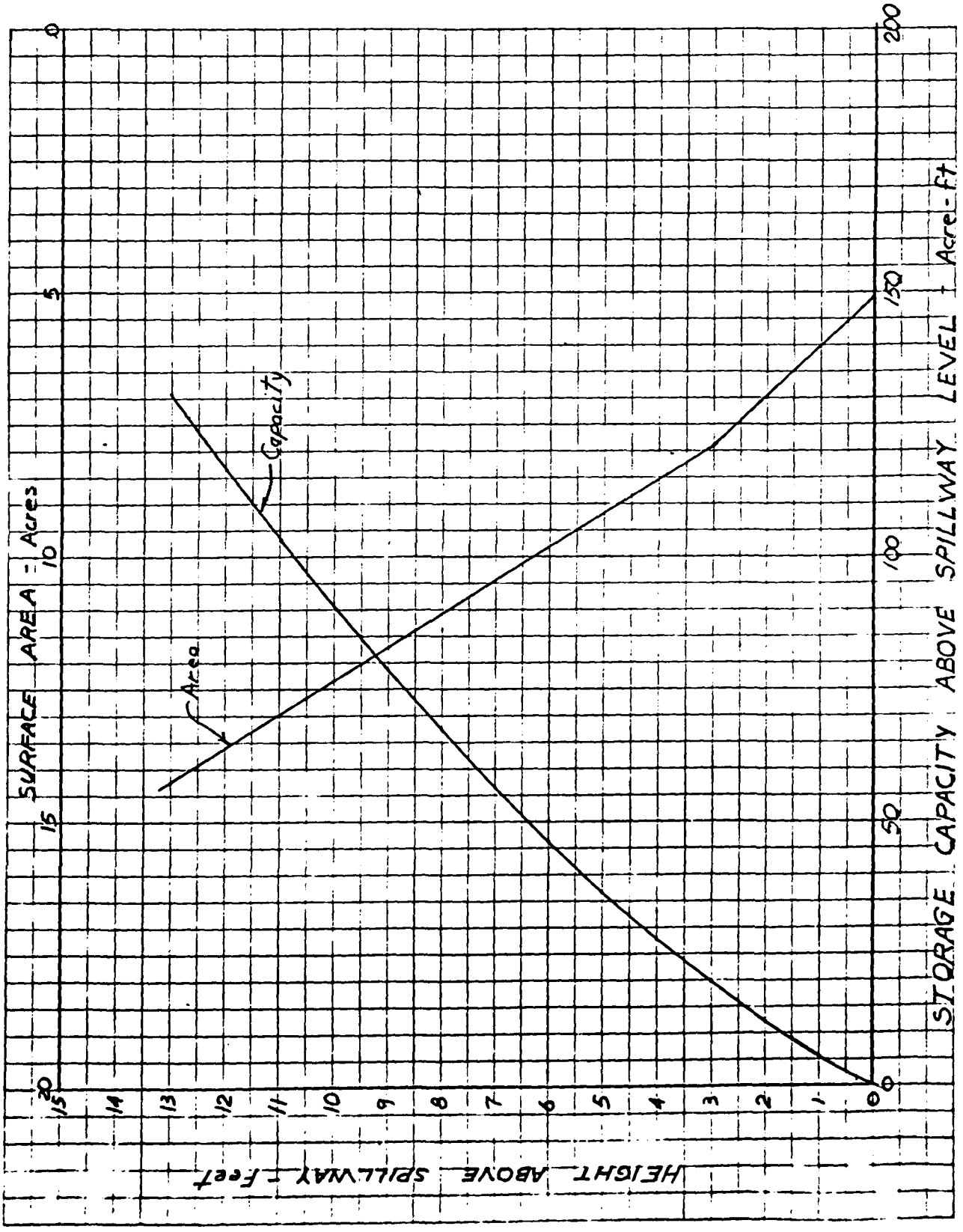


BY SL DATE 1/8/80 **ROALD HAESTAD, INC.** SHEET NO 23 OF 25

CONSULTING ENGINEERS

CKD BY DLS DATE 1/11/80 37 Brookside Road - Waterbury, Conn. 06708 JOB NO 049-09

SUBJECT SEYMOUR NO. 1 - Area - Capacity Curve



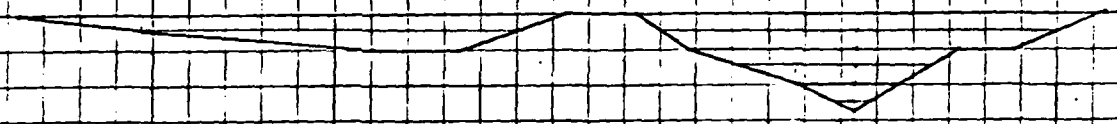
BY DLS DATE 1/10/80 **ROALD HARSTAD, INC.** SHEET NO 24 OF 25

CONSULTING ENGINEERS

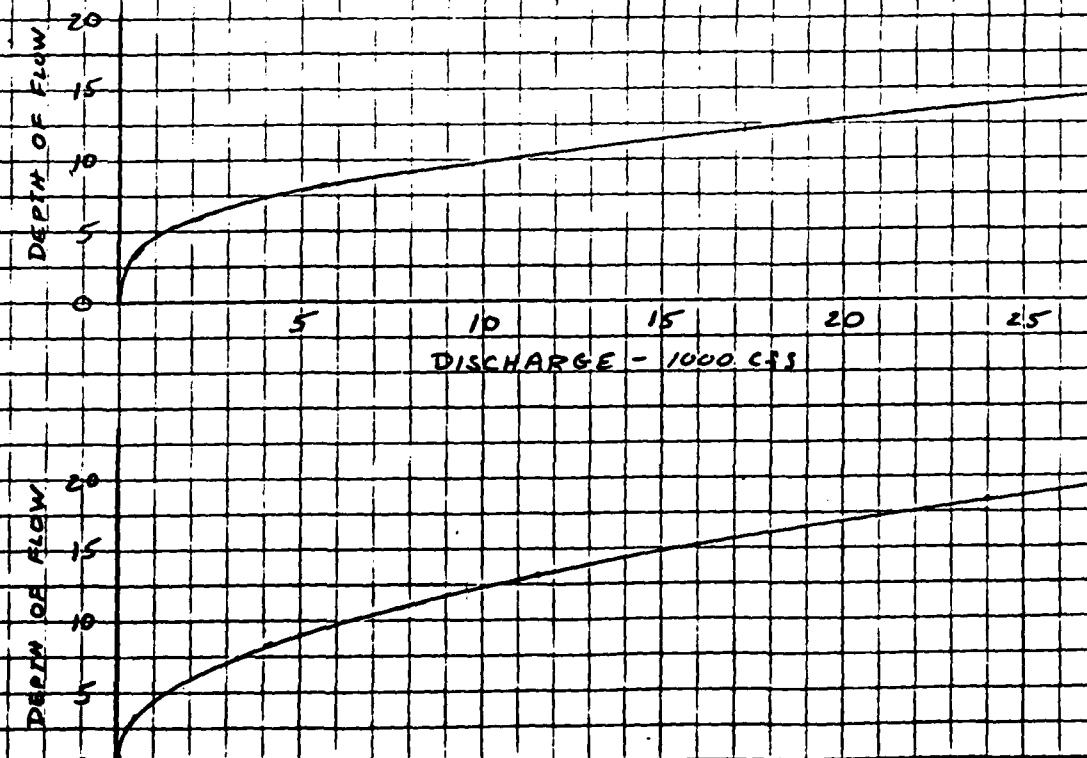
CKD BY SL DATE 1/14/80 37 Brookside Road - Waterbury, Conn. 06708 JOB NO 049-07

SUBJECT SEYMOUR NO 3 - FLOOD ROUTING

SECTION NO 3 (See Figure #4) SCALE: 1"=200' HOR. 1"=50' VERT.



D	Wp	A	R	S	V	Q
3	40	53	1.33	0.027	7.4	392
8	130	416	3.20	0.027	13.3	5533
13	225	1166	5.18	0.027	18.3	21,338
18	335	2404	7.18	0.027	22.7	54,571
23	835	5529	6.62	0.027	21.5	118,874



BY SA DATE 1/11/80 **ROALD HAESTAD, INC.** SHEET NO 25 OF 25

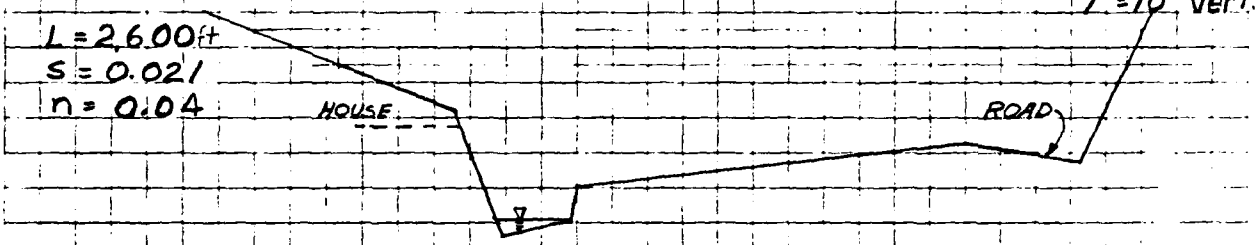
CONSULTING ENGINEERS

CKD BY RHS DATE 1/21/80 37 Brookside Road - Waterbury, Conn. 06708 JOB NO 049-07

SUBJECT SEYMOUR NO 3 - Downstream Flood Routing

SECTION NO 4 : (Field Surveyed)

Scale : 1"=40' Horiz
1"=10' Vert.



D	Wp	A	R	S	V	Q
1	18	9	0.50	0.021	3.4	31
3	23	49	2.13	0.021	8.9	436
5	100	169	1.69	0.021	7.7	1,301
7	150	411	2.74	0.021	10.6	4,357
10	190	897	4.72	0.021	15.2	13,634
13	235	1,483	6.31	0.021	18.4	27,287

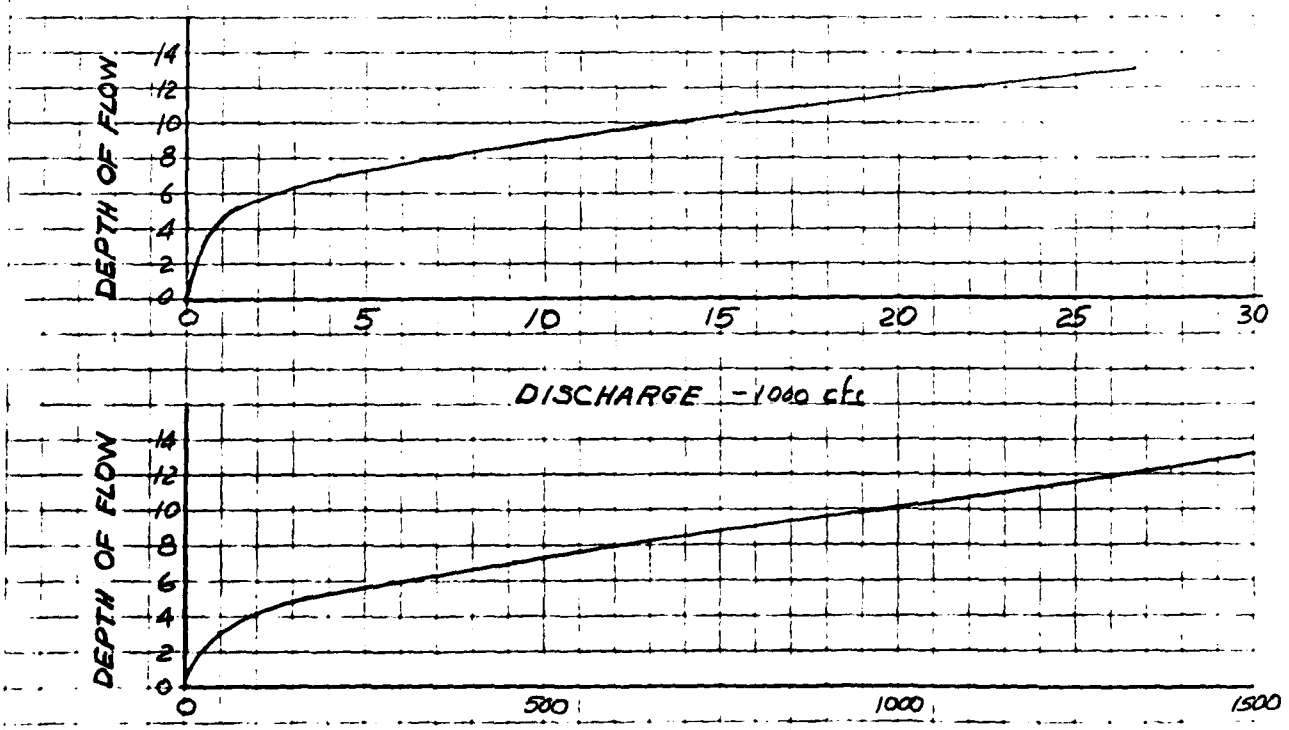
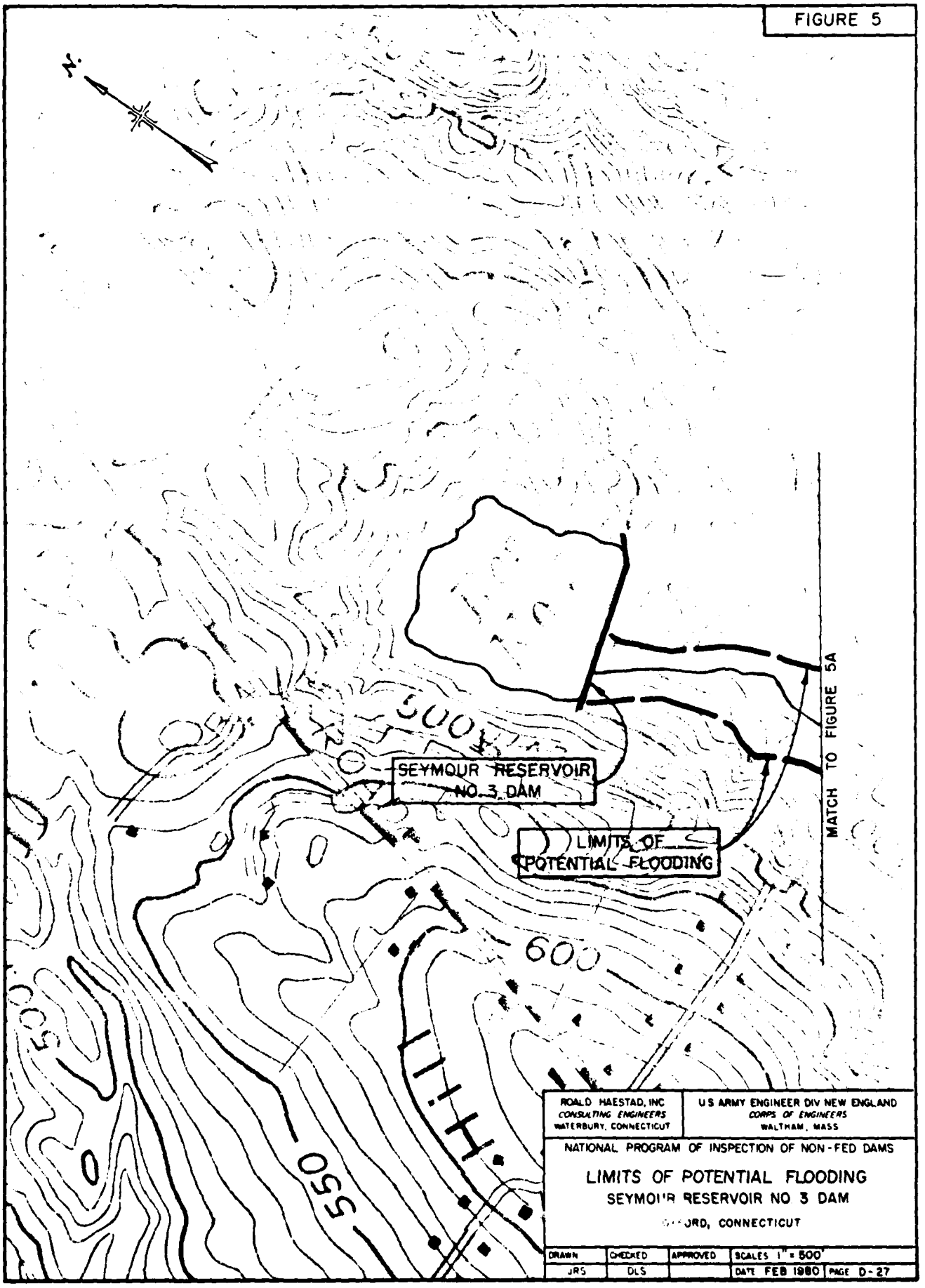


FIGURE 5



ROALD HAESTAD, INC CONSULTING ENGINEERS WATERBURY, CONNECTICUT	U.S ARMY ENGINEER DIV NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS

NATIONAL PROGRAM OF INSPECTION OF NON-FED DAMS

LIMITS OF POTENTIAL FLOODING
SEYMOUR RESERVOIR NO 3 DAM
[illegible]ORD, CONNECTICUT

DRAWN	CHECKED	APPROVED	SCALES 1" = 500'
JRS	DLS		DATE FEB 1980 PAGE D-27

APPENDIX E

INFORMATION AS CONTAINED IN

THE NATIONAL INVENTORY OF DAMS

NOT AVAILABLE AT THIS TIME

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM MASSACHUSETTS 02154

REPLY TO
ATTENTION OF
NEDED-E

APR 2 1 1980

Mr. Stanley J. Pac, Commissioner
Department of Environmental Protection
State of Connecticut
Hartford, Connecticut 06115

Dear Commissioner Pac:

Forwarded herewith for your information and use is a copy of the Phase I Inspection Report on the Seymour Reservoir No. 3 Dam. This inspection was performed in accordance with Public Law 92-367 under the direction of the Corps of Engineers. Copies of the finished report have been forwarded to the Governor and the owner. We thank you for your cooperation and assistance in carrying out this program and hope this report will help you to develop an effective dam safety program.

Sincerely,

Paul B. Fryar

JOE B. FRYAR
Chief, Engineering Division

Incl
As stated

This Phase I Inspection Report on Seymour Reservoir No. 3 Dam has been reviewed by the undersigned Review Board members. In our opinion, the reported findings, conclusions, and recommendations are consistent with the Recommended Guidelines for Safety Inspection of Dams, and with good engineering judgment and practice, and is hereby submitted for approval.

Carney M. Terzian

CARNEY M. TERZIAN, MEMBER
Design Branch
Engineering Division

Richard J. DiBuono

RICHARD DIBUONO, MEMBER
Water Control Branch
Engineering Division

ARAMAST MAHTESIAN, CHAIRMAN
Geotechnical Engineering Branch
Engineering Division

APPROVAL RECOMMENDED:

Joe B. Fryar

JOE B. FRYAR
Chief, Engineering Division

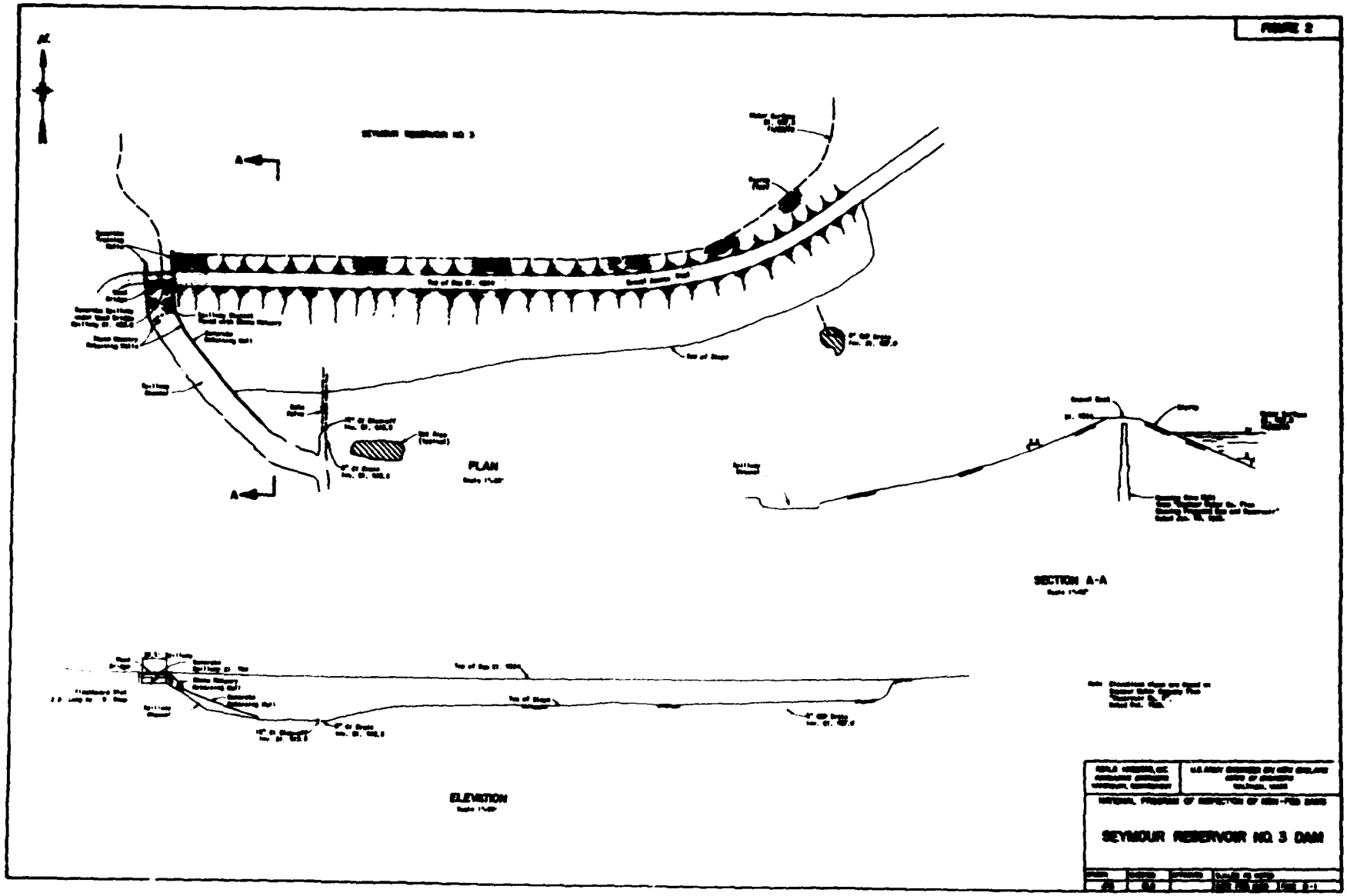
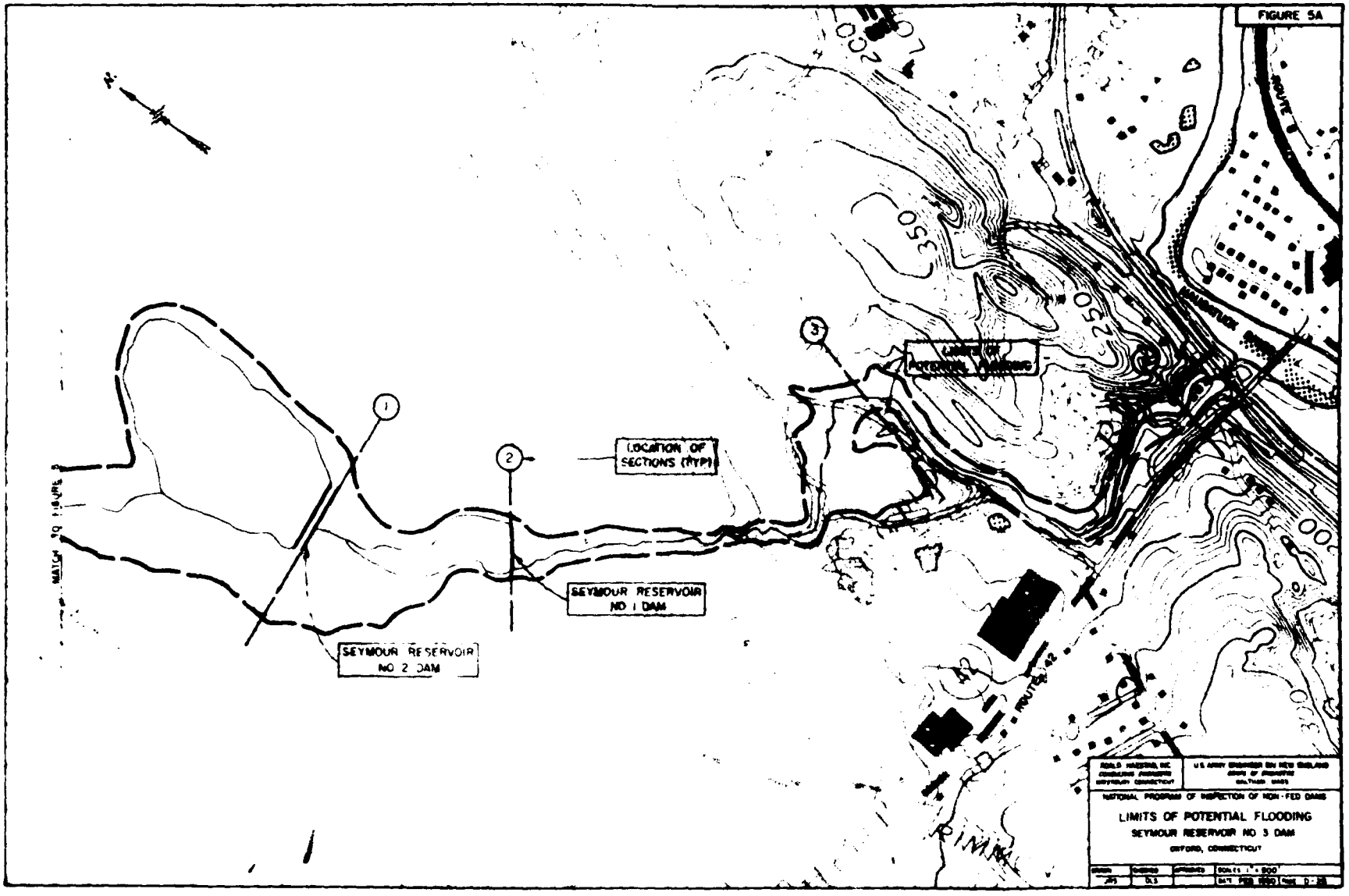
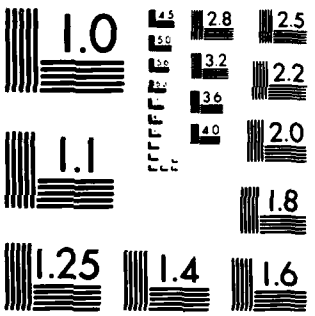

PLAN
SECTION A-A
ELEVATION
SEYMOUR RESERVOIR NO. 3 DAM

FIGURE 5A

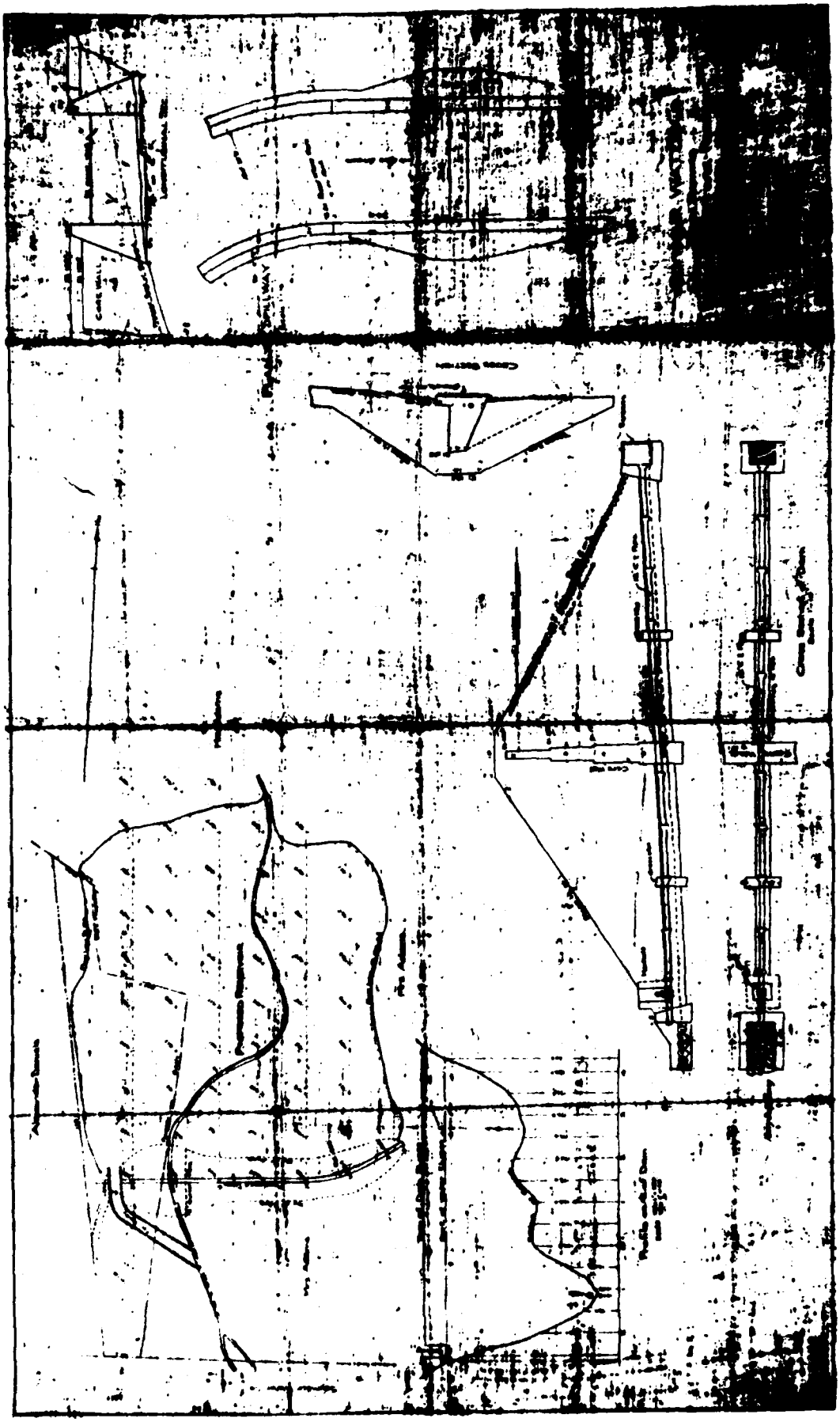

MATCH TO FIGURE
LOCATION OF SECTIONS (TYP)
SEYMOUR RESERVOIR NO 1 DAM
SEYMOUR RESERVOIR NO 2 DAM
ROUTE 42
ROUTE 8
250
350
LIMITS OF POTENTIAL FLOODING
SEYMOUR RESERVOIR NO 3 DAM
OXFORD, CONNECTICUT
NATIONAL PROGRAM OF INSPECTION OF NON-FED DAMS

AD-A144 325 NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS SEYMOUR RESERVOIR NUM..(U) CORPS OF ENGINEERS WALTHAM MA NEW ENGLAND DIV FEB 80 2/2

UNCLASSIFIED F/G 13/13 NL



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A



INVENTORY OF DAMS IN THE UNITED STATES

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9) NAME	(10) LATITUDE (NORTH)	(11) LONGITUDE (WEST)	(12) REPORT DATE DAY	MO	YR
CT	[illegible]	[illegible]	09	00	001			SEYMOUR RESERVOIR NO. 3 DAM	4126.7	7305.4	08	06	80

POPULAR NAME	NAME OF IMPOUNDMENT
	SEYMOUR RESERVOIR NO. 3

(13) LATITUDE	(14) LONGITUDE	RIVER OR STREAM	NEAREST DOWNSTREAM CITY–TOWN–VILLAGE	(15) DIST FROM DAM (MI)	POPULATION
41°	10	TR HEMP SWAMP BROOK	PINE BRIDGE	1	1000

TYPE OF DAM	YEAR COMPLETED	PURPOSES	STRUCTURAL HEIGHT (FEET)	HYDRAULIC HEIGHT (FEET)	IMPOUNDING CAPACITIES MAXIMUM (ACRE-FT)	NORMAL (ACRE-FT)	DIST	OWN	FED R	PRV/FED	SCS A	VER/DATE
[illegible]	1910	S	42	42	245	206	NED	N	N	N	N	

REMARKS

ESTIMATE REVISION COMPLETED 1960

(16) DIVISION	(17) SPILLWAY WIDTH (FEET)	(18) NUMBER OF GATES	(19) MAXIMUM DISCHARGE (CFS)	(20) VOLUME OF DAM (CY)	(21) POWER CAPACITY INSTALLED (MW)	(22) POWER CAPACITY PLANNED (MW)	(23) NAVIGATION LOCKS NO	(24) LENGTH (FEET)	(25) WIDTH (FEET)	(26) LENGTH (FEET)	(27) NO	(28) DEPTH (FEET)	(29) WIDTH (FEET)	(30) DEPTH (FEET)	(31) WIDTH (FEET)
[illegible]	730	3	24	700	55000										

OWNER	ENGINEERING BY	CONSTRUCTION BY
BRIDGEPORT HYDRAULIC CO	CLARENCE BLAIR ASSOCIATES	CW BLAKESLEE AND SONS

REGULATORY AGENCY

DESIGN	CONSTRUCTION	OPERATION	MAINTENANCE
CT DEP	CT DEP	CT DEP	CT DEP

INSPECTION BY	INSPECTION DATE DAY	MO	YR	AUTHORITY FOR INSPECTION
HAROLD MAESTAD INC.	24	07	79	PL 92-367

REMARKS

[illegible] RAISING OF DAM